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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

EDITED BY

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PROFESSOR IN UNIVERSITY COLLEGE, LONDON

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MIND

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OF

PSYCHOLOGY AND PHILOSOPHY.

I.—THE DEPENDENCE OF QUALITY ON SPECIFIC ENERGIES.

I.

The history of Physiology can point to no more memorable event than the discovery of the independent irritability of muscular tissue. When, in the latter half of last century, it became an acknowledged truth that muscles are themselves possessed of the power of reacting against external stimulation, the intelligibility of life entered a new phase. Living motion, the most salient manifestation of vitality, was thus recognised to be the indwelling property of the very material which exhibits the movements. The bodily substance, the concrete material of the muscle, which—like any other matter—had hitherto been considered inert, was now seen to contract by dint of a principle of life residing within its own self; it was found to display its marvellous function of motility independent of outside animation, without the slightest intervention on the part of vital spirits descending to it through the nerves.

The discovery of this elemental fact in organic nature was by no means accidentally hit upon or intellectually anticipated. Only by most patient research and the justified sacrifice of many

an animal life,[1] did Haller at last succeed in proving, or, to speak rigorously, succeed in all but conclusively demonstrating the inrooted vital energy, the *vis insita* of muscular substance, thus founding the science which he himself called "Animated Anatomy".

It was the growing consciousness of the same physiological truth which, not many years later, cast such lustre on Bichat's labours. Inspired with the ideas of inherent vitality and animated anatomy, this young investigator showed that animal parts are made up of a few elementary tissues, and that the vital performances of these parts result from the joint-play of the immanent and specific physiological properties of such elementary components.

This conception of the co-operation of elementary tissue-properties in the effectual production of the most complex vital activities is truly luminous in its quantitative and also in its teleological bearings, but—as will presently appear—it is at the same time extremely misleading in its qualitative applications. However, it has actually proved a conception so fertile and long-lived that, after having originated an era of unprecedented physiological revelation, it still remains the guiding principle of many of the most prominent physiologists. Claude Bernard, so late as 1872, thus enunciated the same profession: "The aim of general physiology is accurately to determine, by experimental analysis, the elementary properties of the tissues, in order to arrive deductively at a necessary explanation of the vital mechanisms".[2]

The thoroughgoing distinction between property and function, *i.e.*, between tissue-energies and their directed uses, which underlies this fruitful view of physiology and which at the present day is more and more urgently insisted upon, must, nevertheless, be accounted one of the chief obstacles in the way of a clear understanding of life; for it does not fit the qualitative activities and centralising regions of the organism.

It is the purport of the present inquiry to show in what manner the leading misconception just referred to constitutes the central puzzle not only of biology but of philosophy in general.

The self-same stroke, which made contractility disclose itself to Haller as the property of muscular substance, shifted also the

[1] "Lætus exitum video immensi operis: qui ab annis retro triginta et sex majorem partem vitæ meæ in id unum impendi. Numerosos libros eo fine legi: animalia pene innumera incidi, et mortua et imprimis viva, ut motus animales eorumque causas perciperem," etc.—*Elementa Physiologiæ*, Vol. 8th, Preface.

[2] *Physiologie générale*, p. 6.

other great property of life, that of sensibility, on to the nervous substance. If, in the organism, muscles are the agents of movement, nerves are evidently the agents of sensation. Contractility being exclusively the vital property of muscular tissue, sensibility must be exclusively the vital property of nervous tissue.

Every one is aware that this fundamental distinction of motility and sensibility as physiological properties belonging to different organic tissues is still echoed by the most advanced biological thought of our age. Yet the organic juxtaposition of motion and sensation has been from the beginning, and continues to be, the source of endless confusion and darkness. Indeed, the envious sprites who grudge to us mortals the penetration of the secret of life must have felt jubilant at this tangled discrimination of modern physiology, expressing at once the outermost contrast and the innermost identity of being. The whole ancient riddle of the universe, which had puzzled so many previous generations, was here most succinctly condensed into the slender compass of a single organic filament, moving at one end and feeling at the other. A narrow and definite stretch of viscid material, commencing as a sensitive nerve and terminating as a contracting muscle, is, in fact, all that Physiology offers as its own contribution to the reconciliation of the Ideal and the Real. Impartially judged, this organic representation of the "twofold aspect" has unhesitatingly to be pronounced a *pons asinorum* from the Physical into the Metaphysical; an hybrid monstrosity, wagging, as it were, its tail in honour of the external or objective world, whilst in its upper regions it is saluting with conscious emotion the spiritual realm of inwardness.

This rather ludicrous picture of the current conception of the two great properties of animal life is drawn with no sense of levity. It is earnestly to be hoped that the general biological perplexity concerning this most critical question may, at last, be definitely dispelled. The more we realise the impropriety of physiologically matching motion and sensation, the better it will stand with the future progress of the science of life. The true relation of the two elemental powers of the animal organism has to be accurately determined before we can expect successfully to unravel the wondrously intricate phenomena of vitality.

The entire world of knowledge finds itself divided into two hostile camps, the one siding with Sensation, the other with Motion. The exact sciences alone still manage to keep at least at a distance from the actual scene of contest. Fortunately for the serene composure of their doctrines they lie outside the pale of unavoidable wrangling. For the present they have chosen their definite course, and do not feel immediately concerned in the unabated struggle, by which the two inveterate antagonists

in the domain of human consciousness are still striving each to assimilate to itself the entire scope of knowledge. A little consistent dodging has thus far effectually availed to lull the scientific mind into the belief or satisfaction that all external occurrences are indeed resolvable into mere modes of motion.

In the presence of organisation, however, we stand at the very spring whence issues forth the double-natured stream of life, involving in its turbulent ambiguity the whole universe of ideas and things; we ourselves emerging from it a mystic confluence of mental states and bodily doings. Here then, in all reality, is the focus where motion and sensation finally and substantially interblend, and no kind of subterfuge can justify the disregard of the claims of one or the other of the two seemingly reverse phases of existence.

Which is the more fundamental fact in the world-evolution: moving or feeling? Reduced to its scientific meaning the conflict lies between the quantitative and the qualitative aspect of existence. In its quantitative aspect the world seems to resolve itself into nothing but an objective combination of motions. In its qualitative aspect the world seems to dissolve itself entirely into a subjective series of sensations. How does this strange dualism take rise within the conscious identity of one and the same individual unit? Is Quality the result of difference in the numerical addition and position of qualitatively equal units, and therefore a mere function of quantity? Or is Quantity itself some kind of primitive quality, the multiple discrimination of an indivisible qualitative unit? This precisely is the problem.

In biology the two-faced enigma has already assumed distinct antagonistic expressions. Eminent thinkers and investigators are ranged on one or the other side. Whilst some are contending for *specific energies* in nerve-substance, others are maintaining the doctrine of its *functional indifference*. The former believe in a material, and therefore qualitative, distinction of the sundry regions of nerve-substance. The latter, on the contrary, believe in a material, and therefore qualitative, identity of all its parts.

According to the doctrine of functional indifference the various qualities, *i.e.*, our well-known sensations, are merely due to differences in the stimulating rhythm, to differences, therefore, of motion communicated from outside to the chemically uniform nerve-substance, and the whole complex make-up of our consciousness is, consequently, thought to result from the co-existence and subsequent combination of such stimulated motions. According to the doctrine of specific energies the varieties of sensation are due to pre-existing differences in the substratum, in which they respectively arise, and all their manifold combinations to higher

products are believed to be realised in materially higher, *i.e.*, specifically pre-endowed ranges of nervous substratum.

In the former opinion, if one could remove without injury to the organ the entire viscid nerve-material which, for instance, fills the channels of sight, and could replace it by the viscid material which fills the channels of hearing, or of any other sense, or even with the viscid material which fills the motor nerve-sheaths, there would result no functional disturbance. The same substance, which, in connexion with the organ of hearing reacted in the quality of sound-sensation, would now in connexion with the organ of sight react in the quality of light-sensation. In the latter opinion, the definite position and efficacy of any portion of nerve-substance is entirely due to its specific material composition, and it could therefore be replaced by no other portion whatever.

In the former opinion, nerve-substance is a chemically uniform substratum of sensibility, itself functionally indifferent, and therefore responding exactly in the form of any stimulating rhythm that may reach it, and filling any functional office, to which it is subserviently attached. In the latter opinion, it is a chemically highly differentiated substratum, consisting of cumulative ranges with more and more complex specific energies. And, consequently, the synthesis of sensations, or rather the manifestation of compound sensation as a transient phenomenon in the present, is not a synthesis of stimulated dynamical units or neural tremors, but rather the unitary functional concomitant of a tissue pre-adapted specifically to respond to special modes of compound stimulation. The synthesis is, accordingly, a molecular synthesis pre-accomplished in the functioning organic structure, not one arising at the moment of functional display through the temporary confluence of special forms of stimulation.

The two views are, as every one readily perceives, nearly diametrically opposed to each other, at least in intention, if not in reality, and they evidently touch the vital knot where, in the organic fabric, Quantity and Quality are all but inextricably interwoven.

It is the cause of specific energies against that of functional indifference, the cause of Quality against that of Quantity, which I wish here to defend.

The fundamental question immediately at issue is: Whether the ultimate analysis of qualitative difference in nature disclose as its origin a purely mechanical configuration and co-operation of dynamical units, or: Whether such qualitative difference be not rather based on the specific and organically secured molecular constitution of the functioning substratum?

Johannes Müller, who, so far as the special senses are concerned,

was the first clearly to formulate the hypothesis of specific energies, unfortunately involved it in the metaphysical discussion about *à priori* faculties. He had, namely, a vague notion that he was thereby investing Kantian transcendentalisms with the tangible garb of physiology. But nothing could have been more remote from Kant's own thoughts than the organic embodiment of any of his *à priori* concepts or forms. His whole system of Transcendental Idealism turns exactly on this point. Hume, with profound sagacity, had pronounced the seeming bond of necessary connexion between natural qualities and between natural occurrences to be of subjective consistency; not, however, *à priori* imposed upon nature, but gradually established, by nature itself, in the perceiving subject. Transcendental Idealism is essentially a gigantic polemical effort against this genetic position of Hume. With Kant the *à priori* forms of pure reason were not endowments or acquisitions of the organic individual; they were, on the contrary, emanations from the "intelligible" Ego, broken rays of the "synthetical unity of apperception," by force of which all manifoldness of experience is assimilated, objectified and ultimately referred to the absolute, super-individual consciousness. I have elsewhere shown that Kant's theory of knowledge is not really, as pretended, a theory of "transcendental" powers, immanent and innate, but that it rests entirely on "transcendent" existence, on metaphysical ontology. All potential and actual energy, in fact all working activity within the entire compass of his intellectual mechanism, is solely derived from the "intelligible" "noumenal," and in no way from the "sensible" "phenomenal" world.

Taking, however, advantage of Johannes Müller's philosophical illusion, the opponents of the hypothesis of specific energies do not hesitate to charge it with being a mere revival of nativism; nothing but the exploded doctrine of innate ideas or forms organically re-expressed. But viewing this question from a more enlightened standpoint, it may be asked: Is not, after all, the entire organism, with its spontaneous exuberance of life and growth, by force of its very presence, the most eloquent and incontrovertible demonstration of every kind of innate faculty, a stupendous assemblage and radiation of nativistic powers co-extensive with our world at large, nay, creators of the same? The only pretext which the advocates of functional indifference can possibly find for their accusation of nativism is to be detected in the vagaries of Phrenology, which system of nescience at last degenerated into the mapping out of all the spacious provinces of conceptualism as bare sinuosities on the outside of the skull, a skeleton nativism of labelled endowments. With much more justice one might retort upon the indifferentists with the

coeval taunt of "*tabula rasa*," an all-efficient yet undifferentiated potentiality, amenable to every desirable requirement and committed to nothing in particular. But this is certainly not the proper ground on which seriously to discuss this momentous question. Only for a moment we had to trespass upon it, in order to disclose the manifold bearings of the problem. As soon as feasible, we will return to biology.

The hypothesis of functional indifference was first enunciated by G. H. Lewes, in his *Physiology of Common Life*, was then adopted by several eminent French physiologists, and, recently, it has been elaborately and independently restated by Wundt in his *Physiologische Psychologie*.

It is certainly a striking incident in the evolution of science that the thoughts of two such universal thinkers and scientific experts as Lewes and Wundt should have so completely coincided in the elucidation of one of the most intricate questions within the entire range of science. Surely there must obtain a necessary convergence of the various trains of knowledge in certain given lines towards the solution of the central problem of modern philosophy—the mutual relation of motion and sensation. The time may not be distant when to the combined efforts of Philosophy and Biology, sensation, the ideal element of our world, will have to reveal its exact mode of dependence on what to the outside observer appears its material substratum.

By accurately formulating the supposed process of that long-deferred ultimate transition of quantity into quality, the hypothesis of functional indifference will undoubtedly render most valuable assistance in the penetration of our venerable enigma, especially as it is presented and defended by men eminent as biological workers and thinkers.

Three scientific aspirations have chiefly co-operated in the construction of the hypothesis: (1) the logical faith in the potency of quantitative science, which, after having subdued to its uniform standard all other regions of externality, is believed to be also competent to conquer the very birthplace of qualitative distinctions; (2) the effort to find a suitable basis for the understanding of the gradual and continuous evolution of the various modes of sensation; (3) the desire to harmonise the nature of the objective stimulation with that of its stimulated subjective effect or issue.

The combined tendency of these aspirations is to show how from the definitely varied configuration of qualitatively equal units the organic groundwork of sensorial evolution and qualitative difference is ultimately secured, and how in this complex organic fabric the stimulating motion, vitally reproduced, harmonises with the original dynamical motion, how, in fact, the

concomitant subjective sensation is essentially but another aspect, a repetition in the sensitive medium, of the outside influence or object.

Before making any attempt to invalidate the correctness and pertinency of the special experiences brought forward in support of the hypothesis of functional indifference, it will be well to probe a little the tenability of its general position.

We will picture to ourselves the manner in which—under the influence of the notion of functional indifference—sensations are conceived to arise in the central regions of the animal organism. It is surmised that in the nerve-substance the stimulating motion, transmitted to it from outside through the assistance of more or less elaborate initial textures, assumes in addition to this its objective form a corresponding subjective form altogether due to the specific nature of the neural substratum; that, in fact, the stimulating rhythm in entering from the dynamical medium into the neural medium, or in causing the particles of the neural medium to vibrate responsively, has now acquired a subjective import, a sensorial potency.

Whence, it must be asked, this peculiar power of feeling now superadded to the peculiar motion, each special stimulated motion awakening a special concomitant feeling? If not derived from extra-organic sources, this completely novel and elemental power, now joined to the motion, must needs be considered an inherent property of nerve-substance. And then it is quite certain that nerve-substance must be a substratum endowed with the specific energy of adding to each special motion a corresponding specific sensation, to each special group or confluence of such propagated motions a specific compound sensation. Nerve-substance, the functionally indifferent, chemically uniform medium, contemplated in this light, must, therefore, be admitted to be pre-endowed with universal sensibility in every one of its parts; to possess, in reality, an all-efficient ubiquitous potentiality of sensation. The sensorial versatility of such a substratum would thus be due not to its functional indifference or qualitative neutrality, but, on the contrary, to the all-sided efficiency of its specific energies. The supposed homogeneous groundwork of sensibility with its pretence to indifference, would, in truth, be everything everywhere, would represent the totality of nature in every one of its constituent molecules, the entire range of sensibility potentially dwelling in each of its structural and physiological elements, subject to the awakening calls of varied stimulation. And, besides, as sensibility is undeniably the medium in which alone the world becomes revealed to us, we should have to adopt the startling conclusion, that this all-sustaining medium of steady and orderly revelation is itself only the in-

different plaything of external motions impinging upon it almost at random.

Organically considered, the assumption of the omnipresence of universal sensibility in nerve-substance appears no less preposterous. Rigorous structural adaptation to the requirements of localised and specialised function is a supreme fact in organic evolution, and it would be passing strange if the nerve-substance inside a motor nerve-sheath, destined, for instance, to stimulate the motions of the great toe, should be molecularly equivalent to the substance which in the corpora quadrigemina ministers to light-sensation, and this again molecularly equivalent to the substance which in the cortex of the hemispheres is the bearer of the most complex modes of sensibility.

The hypothesis of functional indifference rests essentially on the safe general proposition that identity of structure implies identity of property. But it also rests essentially on the very unsafe special supposition that nerve-substance is everywhere identical in molecular structure. The evidence for the structural identity of all parts of the neural substratum is of the crudest kind. It runs thus: Because our morphological and chemical analysis has hitherto failed to furnish any positive proof of structural differences, therefore we are justified in looking upon nerve-substance as identical in all its regions. Now it is an established fact that all functioning material—within the sphere of the ectoderm, at least—appears in its normal, unadulterated state perfectly homogeneous, *i.e.*, structureless to the eye, even when magnified in the highest degree. The hyaline, contractile constituent of muscle is morphologically not distinguishable from the hyaline material which is the substratum of nerve-efficiency. Yet in this unbroken continuity of purely hyaline material, representing the organic medium, which responds to the dynamical stimulations of the universe, there are, nevertheless, molecularly embodied all the accumulated sensorial distinctions and specific motor reactions of our race. With regard to our present skill in physiological chemistry, it suffices to state that only quite recently the most advanced chemists have come to suspect that products of a higher chemical value than food-ingredients are synthetically constructed within the animal organism. Whilst, in truth, the wondrous powers of complex animal organisation, quite incomparable with any unorganised forces, are in themselves decisive proofs of incomparably higher chemical combinations, underlying the same.

In reasoning from the very same foundation as the indifferentists, we are, on the contrary, forced to infer the existence of molecularly organised specific energies. For, with the same certainty that identity of structure implies identity of property,

with the same certainty does difference of property imply difference of structure. Nerve-substance evidently displays those specific energies which are called sensations, and it is not difficult to perceive that "specific energy" is here merely the dynamical expression for specific property. We have seen that specific properties are necessarily the endowment of specific molecular structures. Therefore it is quite clear that distinctiveness of specific energies must always involve distinctiveness of molecular structure.

Accordingly, the apparently homogeneous substratum of "neurility" and "sensibility" has to be considered a structure molecularly specified in every one of its sundry regions, or—in other words—nerve-substance is endowed with different specific energies in different definite localities. Even two nerve-fibres conveying the sensory stimulation from two adjoining areas of skin must structurally differ from each other in a marked degree, for their respective activities or energies contain the element of distinction on which the subjective discrimination of the two different skin-areas is founded.

To sum up: The hypothesis of *functional indifference* necessarily pre-supposes a chemically uniform substratum of neural efficiency, endowed with universal sensibility in every one of its structural and physiological elements. On the other hand, our most intimate and immediate experience, that of a manifoldness and complication of qualitatively distinct sensations, clearly implies a structurally varified and graduated substratum, endowed with correspondingly distinct *specific energies.*

If these be indeed the true alternatives, who can hesitate in his choice, and who can fail to perceive the vast physiological and psychological import of the decision?

In tracing the extreme prospects of functional indifference, I am by no means underrating the force of prevailing scientific doctrines, and the wealth of qualifying opinions, which have concealed them from the penetrating gaze of the original framers of the hypothesis. Indeed, the thorough elucidation of this question involves a radical reform of the entire science of life. For the difficulty which the hypothesis of functional indifference endeavours to overcome is the fundamental difficulty of Biology. It will be well for our present purpose to express it in the most direct and tangible manner. We unmistakably see that the activities of a number of qualitatively equal muscular fibres are combined to joint-effects, *i.e*, to an exhibition of power which is the combined sum of their individual activities. And we see, furthermore, that the peculiar arrangements and connexions of numbers of such individual fibres render their activities subservient to the most diversified uses, as pulling a bone, pumping the blood, con-

stricting an intestine, &c., and subservient, moreover, to the most complicated vital performances, as walking, manipulating, breathing, &c. Here, then, we have the principle of functional indifference actually demonstrated in nature so far as the contractile substratum is concerned. One elemental property of a single uniform tissue is observed to effect the most varied and complex results by mere grouping of units and manifoldness of connexions.

Now the task which offers itself to analogical reasoning, which would give completeness to Physiology, and which the hypothesis of functional indifference seeks to accomplish, is the rigorous application of this very same principle to nerve-tissue.

We have now plainly designated the entire bent and scope of the subject under consideration. In so doing, we have, at the same time, named the *experimentum crucis* of modern physiology, which science is essentially based on the doctrine of the functional association of elementary units.

In conformity with this universally accepted view, it has to be shown, how in the neural substratum elementary units are grouped and connected so as to yield those complex results which are subjectively known as sensations, thoughts and volitions, and objectively in their motor outcomes as co-ordinated movements, intelligible expressions and directed actuations.

It is highly interesting to notice how the two originators of the requisite hypothesis, whilst fully agreeing with regard to the desirability of fitting nervous processes into the formula of functional indifference, are nevertheless led to construct entirely different images of the supposed grouping of neural units, the one thinker following thereby chiefly the glimmerings of psychological, the other those of morphological experience.

Lewes assiduously removes every textural obstacle, in order to establish a homogeneous fluid of sensibility, filling all neural channels. To him this vital fluid constitutes a *sensorium commune*, ever astir with the universal feeling of blended tremors from all points of the organism; a sensitive foil of stationary waves, on which every special change is impressed as a modification of the entire preceding state, rendering it a fluctuating unity of sensations, of which only under favourable conditions some special conformations gain the height of conscious realisation.

Wundt carefully follows up structural forms and connexions, and, finding everywhere the same simple textural elements attached to very different organs and endlessly reproduced in most diversified central configurations, he infers that difference of sensorial experience can only be due to difference of structural connexion, and that synthesis of sensorial experience can only

result from the consensus of the elementary activities of grouped textural units.

Surely it is the "philosopher's stone" of our age, so to wield quantitative arrangements that therefrom may arise the great magisterial essence—Quality. It is from co-ordinate multiplicity that science is striving somehow to extract the incommensurable sensorial effluence that forms our psychical aura, and nerve-tissue is the ultimate local recess where, if ever, there has, at last, to take place that glorifying transfiguration from outward uniformity to inward diversity, and from separateness of elementary activities to all-comprehensive unity of being.

I think it will be hardly denied in principle by any biologist of the present day, that the vital activity of any kind of organic tissue is due to a manifestation of its own inherent energy, and never directly to the manifestation of any energy applied to it from outside.[1] This is what Haller proved with regard to muscle and nerve, and it is, in fact, essentially all that is implied in the recognised doctrine of stimulation and irritability. Outside influences only set going activities, the energy of which has been organically composed and gathered within the performing structure, and they do not themselves directly enter into the composition and nature of the vital exhibition which they merely initiated. In the framing of any hypothesis concerning vital processes, it must therefore never be forgotten that vital energies are in all instances the indwelling property of the living tissue by which they are manifested, the external forces playing functionally only the part of excitants. And it is easily seen that this unexceptional physiological state of things means exactly that it is the energies residing in the living structures which are specific, whilst their stimuli must in every case be looked upon as *comparatively* indifferent. Mechanical, chemical, physical stimulation, one and all, excite essentially the same contraction in the muscle, the same molecular change in the nerve. This, however, does not exclude that special tissues or regions have come to be most subtly adapted to special modes of stimulation. It only shows that at any given moment the liberated energy in the stimulated structure is entirely inherent and specific. Whenever certain features of the stimulating motion are found to be reproduced in the vital motion, then the organic substratum in which the corresponding change occurs has to be considered pre-adapted to the stimulating medium. The feature which the two motions have in common is in all such cases co-existent

[1] The conception, current in some quarters, that muscular power is derived from the combustion of food-ingredients is altogether unphysiological and fundamentally erroneous. This I have explained in the New York *Popular Science Monthly*, Sept. and Oct. 1878.

and permanently fixed in the tissue and in the medium, and is never in the former the mere temporary effect of special stimulation. The specific adaptation of organic structure to special modes of stimulation is therefore a problem of structural evolution, and not one of immediate and efficient causation.

Indeed, Lewes as well as Wundt virtually yield the entire argument, when they expressly admit that nerve-tissue is apt to become by frequent exercise pre-disposed to certain specific modes of reaction; so that, for instance, even artificial stimulation will prove efficient to awaken through the optic nerve light-sensation. If indifferently, or rather universally, endowed nerve-substance can under normal conditions become so modified as to manifest in its own exclusive self a specific or one-sided energy, then it is evident that in the course of time the one-sided disposition will be converted into a preponderating property; that, indeed, after many successive generations of steady exposure to the same modifying conditions, the respective tissue will have become the organised representative or substratum of this very same one-sided or specific energy. This is, in fact, the general law of organic differentiation, and it certainly must find its supreme application in the sphere of centralising sympathy, where the manifold differentiations of the organism are finally represented and discriminated. Nerve-substance, by means of its decided and multiform structural modifications, constitutes essentially the substratum of organically secured qualitative distinctions.

One more consideration for the sake of completeness. The molecular process in nerve-tissue is, like all other vital processes, one of decomposition and recomposition, *i.e.*, one of functional discharge and subsequent functional restitution. Now a chemical process is in all instances directly and rigorously dependent on the nature of the combining or separating substances, and only indirectly and loosely dependent on the nature of the dynamical medium. These obvious conditions must apply pre-eminently to a most complex compound, the very existence of which is altogether determined by the preservation of its identity of structural composition amidst an incessant flow of chemical change. The specific molecular processes which constitute the functions of nerve-substance must, therefore, be essentially due to its own inherent efficiency.

Continuity of development would seem to desiderate some primitive sensorial element, of which all existing sensations are but modifications or combinations. A postulate of the kind may be valid to some extent in the sense that it has always been a portion of one and the same common protoplasm that has become elaborated into the substratum of specific sensations, but

it can in no way be valid in the sense that some fundamental sensation has itself become gradually developed and differentiated into the various specialised modes of sensation.

Touch has, to all appearance, to be looked upon as the most fundamental of our senses, unless, indeed, taste, the chemical food-test, the original complement of restitutive nutrition, be still more primitive. Sight, however,—to take an extreme instance—is evidently not evolved from touch, but rather superimposed on it. For it is not likely that functional adaptation to an ethereal stimulus has grown out of functional adaptation to the incomparably coarser stimulation which actual contact with surrounding objects affords. More plausible would be the derivation of sound-sensation from touch, but this also is, for various reasons, problematical. It would be hypothetically consistent to think of light-sensation as evolved from primitive modes of stimulation by solar or radiant energy, which supposition would point to the existence of separate structures through which temperatures are felt and discriminated.

In searching for a quantitative foundation of Quality, it might furthermore be surmised that difference of sensorial quality is based on the frequency with which neural tremors occur in the nervous substratum, 19·5 tremors in the second being, for instance, efficient to tetanise a muscle, whilst 20,000 tremors would give rise to sound-sensation, and so on. But it must be remembered that the power of the organic structure numerically to reproduce the dynamical medium-vibrations is a vital energy entirely dependent on the peculiarity of its own molecular composition. The substance whose property and function it is to accomplish 20,000 vital vibrations in the second, must differ essentially in molecular constitution from the substance whose pitch of functional vibration is only 19·5.

Now we have arrived at the one celebrated experiment which is generally brought forward in support of the material identity of sensory and motor nerves. This experiment was first performed by Philippeaux and Vulpian, and has since been verified by various observers. It consists in producing a mixed nerve by first dividing both the motor and a sensory nerve of the tongue, and then allowing the peripheral end of the motor nerve to grow together with the central end of the sensory nerve. By this union an artificial nerve is established, having a central half formed of an originally sensory nerve-portion, and a peripheral half formed of an originally motor nerve-portion. If the originally sensory portion of this ambiguous nerve be pinched anywhere along its course, the animal experiences not only pain, but, at the same time, movements are induced in the muscles of the tongue. The mixed nerve conveys evidently impulses both

ways, and the same stimulus excites centrally sensation and peripherally motion. Thus far the experience is undeniable, and it is this actual state of things which is so forcibly adduced in proof of the identity or functional indifference of nerves. Apparently one and the same nerve is here observed to excite either one or the other effect according to the nature of the organ with which it is connected, a motor organ reacting in the form of a contraction, a sensory organ in the form of a sensation. It seems, therefore, that the nerve itself is neither motor nor sensory, but functionally indifferent.

We will presently see how extremely difficult it is to contrive decisive experiments with living tissues. We know that almost any kind of stimulus applied to a muscle will induce contractions. Even an electric shock conveyed through a nerve which happens to be merely in contact and not at all in structural continuity with a muscle, will induce contraction in the same. So coarse a disturbance as the one caused by pinching will readily be propagated even through very imperfectly regenerated nerve-structure, at least in a degree sufficient to excite contraction in the adhering muscle. That the nerve is very imperfectly regenerated, or rather very unequally endowed with conductive power, is proved by the fact that no pinching of the originally motor portion will cause pain. This is all the more significant when we remember that in Paul Bert's experiment with invertedly grafted rats' tails pain is already experienced after a few days, though it takes many months to accomplish by regeneration the complete inversion of normal tactile sensibility. Surely there must exist in the mixed nerve some impediment due to the originally motor nature of its pinched portion. How could otherwise this coarsest kind of stimulation fail to reach the central organ? It seems that the neural process in a motor nerve is not only incapable of stimulating central sensory organs, but incapable even of stimulating sensory nerves. The experiment under consideration demonstrates therefore rather the opposite of what it was intended for. It shows that a sensory nerve is, under certain conditions, efficient to stimulate a motor nerve, whilst, under the same conditions, the motor nerve proves inefficient to stimulate the sensory nerve. There must, therefore, exist a pronounced difference between the two kinds of nerves.[1] The lingual has not become a motor nerve,

[1] Perhaps the correct explanation of this somewhat paradoxical relation between lingual and hypoglossal may be found in the simple circumstance that the lingual contains in itself motor fibres derived from the facial. It may be these chorda fibres alone through which motor conduction is established. This, however, would also demonstrate a specific difference of the nerves implicated.

for it does not convey normal motor stimulations. The tongue remains paralysed. Neither volitional nor reflex influences are propagated. The hypoglossal has not become a sensory nerve, for it does not even excite pain, much less a specific sensation. Nor has the mixed nerve become functionally indifferent. If, however, any of the two former suppositions were actually realised, it could only occur by means of a thorough regeneration. The fact that it takes many months to establish reverse tactile sensibility in a rat's tail when a few days suffice to organise the necessary conductibility for the stimulation of pain, affords an additional proof of the specific organisation of nerves. To form a conception of the vast and subtle powers at work in the achievement of this sensorial reversion, we need only consider that Legros has witnessed in much less time the regeneration of the entire tail in hybernating individuals of the same family.

In confirmation of a specific difference obtaining between sensory and motor nerves, there might be urged, first, their different mode of dying when poisoned or when deprived of nutriment; but these peculiar phenomena may be differently explained, which renders them uncertain for our present purpose. Secondly, might be urged the different rate of velocity with which they apparently convey impulses; but the subjective factors of attention and practice enter into the measurement of sensory conduction, and make the subjective result problematical.

The truth is, there exist no decisive experiments either one way or the other. But from general laws of vital activity it follows with great certainty that impressions from the outside world, transmitted with all their specific distinctions to the nerves through the agency of minutely appropriate organs of sense, have in this transfigured form to be propagated with all their characteristics along single nerve-fibres till in the central organs they acquire combined and sentient values. The power of thus responding by consentaneous molecular changes to the special and multiform variations of the external influences is a power gained by nerve-tissue through most specific local adaptation to special modes of stimulation. This adaptation can be reached only through the thorough structural fixation of a consonant molecular constitution, and is evinced by the display of corresponding specific energies.

It is in this manner that the congruity of the dynamical stimulus or objective influence with its vital reproduction or sensorial representation has to be physiologically conceived. It is by the creative outburst of organised energy, and not by mere passive receptibility, that nerve-tissue becomes the medium of our world-revelation.

II.

All preceding reflections have been merely preparatory. Now, however, we come to the pith and marrow of this knotty question.

Physiologists of all schools are agreed that the specific molecular processes that normally take place on stimulation in the well-known organic structures called sensory nerves, are to be looked upon as the elements of that peculiar activity of which somehow our coherent sensorial experience is built up. No one doubts that the chemical or—as some will have it—the physical motions, started in the sensory nerve-elements at their peripheral end and propagated through them to the so-called nerve-centres, are themselves phenomena necessarily connected and concomitant with feeling. In fact these motions in the substance of elementary nerve-structures must evidently be the objective expression of the same process which in its subjective aspect constitutes the elements of sensation. It is then unmistakably the inherent property of sensory nerve-elements to manifest on stimulation the elements of our sensorial experience. Thus far we can distinctly trace the material complement of feeling, morphologically and physiologically. We can see where, and also to some extent how, in the organism the elements of feeling arise. But now comes the puzzle. It is, namely, clear beyond suspicion that our sensorial experience is not made up of a mere mosaic of elements; that it, on the contrary, consists of a complex unity, of a confluence of thoroughly integrated energies. Somehow and somewhere in the organism there must, therefore, be accomplished a compounding and recompounding of sensorial elements.

The great problem is to gain an understanding of the means by which is actually realised this evident synthesis and integration of elementary neural activities.

This is precisely the task which the hypothesis of functional indifference has taken upon itself. It attempts to point out how neural elements are grouped and connected so as to produce complex results, so as to manifest compound sensations. I have already stated that in the endeavour to extract quality from quantity consists the "philosopher's stone" of our age. Following the mighty sway of quantitative science, who knows how many centuries might, this time also, elapse in the vain pursuit? We will strive to liberate ourselves from the engrossing spell by seeking for a solution in other directions.

To bring the occult properties and functions of nerve-tissue somewhat within reach of our comprehension, it will be well to compare them with the more obvious properties and functions

of muscular tissue. And, as nerve-tissue becomes fully developed only in the highest animal organisms, it is their muscular arrangements that have to be consulted for corresponding information. We will endeavour to find how, by the grouping of elementary units and by their organic connexions, complicated results are achieved in the sphere of Contractility. We shall then be in a position to judge whether analogous conditions can possibly obtain in the domain of Sensibility; whether the elementary constituents of nerve-tissue are also actually so grouped and connected as to accomplish, by force of such local arrangement, the compound effects attributed to them.

This mode of elucidating so intricate a subject as the one under discussion will be found all the more appropriate for the reason that, knowingly and unknowingly, the visible phenomena of muscular activity govern at the present time the intepretation of the invisible phenomena of neural activity.

It is essentially by dint of their contraction that muscular elements produce their objectively tangible effects. A multitude of contractile units, by joint-action, and by being all connected, for instance, with a single tendon, will pull at the same, and will bring about a dynamical effect which is undoubtedly the resultant of their combined individual energies. We have here, so far as the mere external effects are concerned, nothing but a purely mechanical problem before us. No matter that it is an organic energy and a vital molecular process which give rise to these dynamical results; the force acquired by the tendon is, nevertheless, strictly the mechanical product of all the individual contractions manifested by the co-operating vital elements. Such, at least, would be rigorously the case if the tendon itself consisted of molecularly rigid material. At any rate, the movement of a tendon is essentially mechanical and not vital; it is imparted from outside, not intrinsically awakened. The contraction of the muscular fibres is also a purely mechanical occurrence, a mere forcible shifting of mass in space. But it is based on a molecular process in the moving elements which is not itself the resultant or equivalent of external forces, which, on the contrary, is the intrinsic display of accumulated and organised energies. It is a vital process which here underlies the mechanical result, a process the energy of which is stimulated and not communicated.

What, it must further be asked, is the *conditio sine qua non*, which enables a multiplicity of moving elements of any kind to combine their individual activities in such a manner as to produce an *adequate* joint-effect of the mechanical order? They must evidently exert their force in the same direction on one and the same continuity of external substratum, which sub-

stratum has to be itself molecularly rigid, though perfectly movable in space as a coherent mass. In the organism these conditions are never exactly fulfilled. But, on the whole, tendons are to muscular fibres, and bones are to tendons, combining recipients of mechanical energies. A medium of composition is indispensable to the summation of energies. To realise the complete dependence of mechanical resultants on a combining substratum, one may fancy for a moment all the individually contracting muscular elements severed from their attachments. They might then still be capable of contracting with the same energy as before, yet no co-operative result would be accomplished. The medium of dynamical combination would be wanting. The multiple energies, singly exerted on no common recipient, would lose themselves in entirely isolated and disconnected efforts. These last remarks will probably appear to most readers superfluous, and they would certainly deserve to be considered so if we were not here treating of physiology and psychology, which sciences deliberately aim at the monstrous feat of making "two and two" constitute "four" without the help of any kind of synthetical medium.

Besides molecularly rigid and freely movable masses there are other, though less adequate, media of dynamical synthesis. The combining medium may be a rigid solid, immovable in space: or it may be an elastic solid, movable or immovable. It may also be a more or less molecularly disentangled fluid, elastic or inelastic; movable or immovable in bulk. In all these cases the kind of matter of which the combining medium is composed begins to assert its influence. It is not alone the quantity of substance, but also its quality, which now enters into consideration. The perfect mechanical result is marred by the intrusion of specific physical properties. The resistance to be overcome by the external forces cannot be measured simply by the uniform standard of mass. The different molecular forces of the sundry kinds of matter exert a power of their own, which has to be taken into account. Yet, as the sum of the molecules makes up the mass of the body, as during the dynamical changes the molecules remain themselves intact, and as the specific molecular forces are taken as uniform throughout, there still persists under these physical complications a calculable relation between the moving forces and their mechanical result.

But the recipient of external impulses may also be a chemical medium, *i.e.*, a substratum atomically more or less unstable. Or it may be a vital medium, *i.e.*, a chemical substratum alternately explosive and restitutive. In these latter instances the relation between the impelling forces and their mechanical result becomes exceedingly obscure, and generally altogether

ncalculable. Vast and most specific activities, potentially pre-existing in the composition of such chemical and vital substrata, are set going by the external influences, and obliterate, by the overwhelming power of their own intrinsic display, the traces of mechanically transmitted action. Here it is mainly the kind of matter which determines the value of the excited commotion, and its total mass or number of molecules merely multiplies by so much the specific effects.

It is clear that such almost self-acting substrata, in which peculiar internal energies have complete sway, are unfit for the dynamical composition of propagated impulses. Dynamical laws, though strictly applicable to all mechanical results of vital activity, are in no way applicable to the vital activities themselves. The contraction of a muscle, for instance, is a purely mechanical event, but the atomical process on which it is dependent is by no means itself a mechanical event. The potential energy accumulated and liberated in the contractile substratum is pre-existing, intrinsic and specific, and therefore dynamically incalculable. In vain are scientists attempting to find a measure for muscular power in the units of heat evolved by the combustion of muscle or food-ingredients. The power of muscle rests entirely on its evolutionally ingrained affinities, and not in the burning of any transient material. It is obvious, then, that a vital substratum, a substratum stimulated to vital activity, cannot possibly form a medium for the dynamical combination of the stimulating impulses. If, nevertheless, a synthesis of stimulating energies is found to occur in any vitally reacting tissue, then it must certainly be accomplished by means altogether transcending the modes of mechanical operation.

It is my present endeavour to explain how the synthesis of specific energies is in reality accomplished in the animal organism, how sensations are organically compounded.

For the sake of completeness, we have to enumerate one more synthetical medium. It can namely be hypothetically conceived that the combination of a multiplicity of energies may find its realisation in some metaphysical substratum, in which instance quality is supposed to manifest itself, not as a specific structural energy, but as something having its subsistence in a hypervital and hypersensible sphere.

We are now clear about the means by which the energies of contraction, manifested by a number of individual muscular fibres, are combined to a joint mechanical effect. We can furthermore easily perceive that the direction, sweep and velocity of the resulting motion is to a great extent conditioned by the peculiar arrangement and definite mode of attachment of the contracting fibres, and conditioned also by the peculiar posi-

tion and definite mechanical enchainment of the textures moved by the attached fibres. In the motor system we have before us a complex mechanical instrument, which, within certain definite limits, admits of an endlessly varied and modulated dynamical play. This living instrument is constructed, is, evidently, somehow organically preconcerted, for the achievement of certain definite dynamical results, which results are to be wrought upon a given external medium—a medium, however, incessantly shifting and changing according to laws only intrinsic to itself. There are, then, besides the physiological problem of the generation of mechanical energy by vital processes, two other distinct problems which are here offering themselves for solution, *viz.*, the apparently teleological problem of the construction of the instrument, and the apparently metaphysical problem of the playing of the instrument.

The great and as yet unsolved mystery of the shaping and adaptedness of the mechanism does not at present concern us. But it falls to our immediate task to have to inquire somewhat into the synthetical power of the nervous centres, to seek to catch a glimpse of the hidden influences that so effectually play the instrument. Whoever wishes to form some idea of the significance of nerve-centres, even so far merely as the concordant actuation of motor performances is concerned, need only imagine all motor nerves severed from their central connexions but retaining their vitality. Now it may be conceived what exceeding foresight and myriad-fingered skill would be required so dexterously to tap the severed nerve-ends as to mimic, by means of this artificial mode of stimulation, the normal action of the nervous centres on the organs of motility.

Surely the central mass of organised material which lies between the individual inlets of sensory nerve-elements and the individual outlets of motor nerve-elements must either be itself marvellously endowed with compound specific energies, or it can be merely an instrument for the transmission of neural tremors to some hypervital medium, in which compound sensory rhythms are sentiently realised, and from which compound motor rhythms are effectively issued.

Synthesis somewhere occurs, most complete synthesis of all elementary neural activities; sensory synthesis till the most collective thought is shaped; motor synthesis till the most comprehensive volition is consummated. We desire to know where and how these highest feats of life are accomplished. But this time the question is not: "How are synthetical judgments *à priori* possible"? The question is: "How are synthetical sensations and volitions organically possible?" Until this is positively answered, until we have gained an

insight into the organic fixation of sensory and motor compounds, the very keystone of science and philosophy is wanting. Our knowledge consists merely of the outstanding supports, and there remains a central void in the grand triumphal arch of our understanding, filled as yet with nothing but vague picturings and hazy concepts.

Keeping still only the motor side of the ectodermic arc in view, it would but little avail if the final desideratum of the mechanical school were actually fulfilled, if there existed in reality an ever so complete and exhaustive network of direct and definite intercommunications between the sensory elements and the motor elements.[1] In an apparatus of this description the motor impulses would be received directly from sensory elements, and the motor instrument would then evidently be played exclusively by the external forces which stimulate the peripheral origin of these sensory elements. The spread of the motor effect would be in some degree proportionate to the intensity of the stimulation; but the vast store of consciously and unconsciously interposing experience or memory, generical and individual, would, under such conditions, count for nothing whatever. Movements would cease to be in any sense voluntary. Indeed, they would be at least as rigorously determined by outside influences as our direct sensations are felt to be. The motor system would represent a subtle mechanism, solely

[1] It must be acknowledged to the great credit of observers, especially German observers, that in this supreme and crowning task of textural analysis they have stoutly resisted the fascinations of imaginary histology. When one considers that the present conception of nervous activities rests chiefly on the assumption of direct intercommunications between sensory elements with other sensory elements, between sensory elements with motor elements, and between motor elements and other motor elements, one may well feel proud of the scientific self-control of the men who, under the most alluring conditions possible, amidst crowds of seemingly favourable appearances, have nevertheless repressed their own personal bias, in order to record with vigorous precision the overruling teachings of nature.

Perhaps there is still a little too much reliance placed in the morphological appearance of artificial preparations. But in this respect also immense progress has been made since the old Würzburg and Berlin days, when it was thought necessary to macerate and to cook tissues in strong acids, alkalies or spirits, for the purpose of forcing into view their hidden textural secrets.

Some microscopical philosophers profess an implicit faith in the discriminative powers of carmine, and practise extensively the histological rite of rubricating life-inspired dots. They believe, namely, that certain reddening particles are entrusted with the sad mission of erecting under self-immolation Death's sanctuary in the shape of animal brain and muscle. So mortifying and mortified a conception of vitality defunct is evidently intended to give timely warning to us all, not that we have sooner or later to die, but that we are already dead. Great are the revealing gifts of carmine!

actuated by momentary impulses, impinging upon its recipient points almost at random. It is hardly necessary to waste many words in contesting a view so utterly at variance with nature. We are unhesitatingly certain that our movements are not exclusively directed and controlled by the peripheral stimulation of sensory elements. In shaping our actions we are not slavishly executing the immediate promptings of our actual environment; but, on the contrary, we are ever drawing from a well-assorted fund of pre-established resources, deep, old and unfailing as life itself. This is so palpable a truth that no serious doubt concerning the same has ever gained, or can ever gain ground. No wonder, then, that we are anxious to learn something more definite about this grand reserve of slowly accumulated power, which is so constantly and intricately intervening between external stimulation and muscular reaction, between sensations and volitions.

In examining motor activities, we have become aware of the principal problematical points connected with their composition. We had, above all, occasion to distinguish between the composition of contractions and the composition of innervations. We found that the synthesis of contractions is essentially of a mechanical character, whilst the synthesis of innervations seems, on the contrary, to be, somehow, actuated from a metaphysical position.

Now we will turn our attention to the sensory side of the ectodermic arc.

It makes no material difference in the following argument whether the effects of stimulation, transmitted through the single nerve-fibres to the nerve-centres, are thought to be peripherally acquired during function, or whether they are believed to be merely intrinsically re-awakened: the effects themselves are any way admitted to be specifically sensorial and of an elementary nature. This granted, a very obtrusive, yet altogether unsolved, question at once urges itself upon our consideration. It may be thus plainly stated: "How and Where are the objectively traceable elements of sensibility combined to higher products?" With the subjective side of the products we are immediately and intimately conversant. Our consciousness is filled with them. Indeed, compound sensations are the stuff of which our world of consciousness is wholly made up. But, in objectively following the substratum of sensibility, *i.e.*, the sensory nerve-elements themselves, to the place where they all converge towards one common centre, they seem there to terminate singly, to come to an isolated end. It is highly significant that, contrary to their theoretical expectations, the most accurate observers have hitherto failed to discover any direct

central intercommunications between sensory elements. Psychologists, leaning on second-rate histology, have nevertheless very generally assumed such connexions. But, even if the normal existence of central sensory anastomoses were a well-established fact, it would render no assistance in the penetration of the mystery by which we are here confronted. The puzzle of sensory synthesis would be as great as before.

We must no longer refrain from unshrinkingly facing the extreme functional issue on which the fate of modern physiology is destined to turn. The composition of vital phenomena by the functional association of elementary units is the fundamental axiom on which modern physiology is based. How, then, are the compound effects of the many and disparate activities of sensory elements actually realised? This undoubtedly is the decisive question.

No difficulty was experienced in understanding how the individual energies of muscular fibres are dynamically combined in tendons and bones. In the sensory sphere, however, there exist apparently no combining media. Indeed, as the neural process in the central termination of sensory nerve-elements is exclusively of a chemico-vital nature, without the exhibition of mass-motion, it is clear that a medium of mechanical combination would be here entirely out of place. How, then, are the divers specific manifestations, occurring within the secluded compass of the sundry sensory elements, combined to joint-results. If we had before us a hundred iron balls, or a thousand of them, grouped in whatever manner; if these balls were now all heated, equally or unequally, but each separate ball protected against the diffusion of its heat; could there possibly occur in such a system of isolated balls any sort of compound calorific effect? By force of their indwelling vitality and acknowledged individuality, neural elements represent such isolated balls. Their functional discharge is due to forces accumulated and liberated within their own substance. The peculiar vital phenomena connected with the functional discharge must therefore remain entirely confined to the limits of the performing substance. No heightening or composition of vital effects through the simultaneous action of ever so many isolated vital units is at all thinkable. This we have already illustrated by imagining the muscular fibres severed from their attachments. Their individual contractions can then accomplish no joint-result. Nerve-elements do not even manifest contraction. All their energy is spent in inward commotion, Where, then, it must be asked, do these inward commotions join and chime?

An answer, but, I think, a very evasive and superficial one, is offered. It is, namely, universally assumed among physio-

logists that the separate activities of sensory elements are compounded by means of yet undiscovered textural intercommunications between the various elements. This is exactly as if anyone were to maintain that a compound of the separate feelings experienced by each individual during the passage of an electric shock through a chain of persons existed in reality somewhere outside or inside the group of affected persons. It is, however, quite certain that each individual unit merely reacts by force of its own inherent capacity. The vital effects of the shock remain entirely confined to the sundry individual organisms, and do not pass from one individual to another to appear somewhere as a compound result of all the individual manifestations. An ever so large number of simultaneously affected units will not intensify or multiply the result by one jot. This principle of isolated function is not much more difficult to comprehend than the allied principle of isolated conduction, yet when fully appreciated it will completely transform biology. For it is the cardinal mistake of our present science to expect intensified and qualitatively compound results from the co-operation of functionally associated units, unaided by any synthetical medium.

To believe that the individual activities of any number of sensory cells, however significantly grouped, can ever result in a common consensus, in a blended feeling of these activities, is to believe in metaphysical effects. To believe that such elementary activities, individually exerted, can ever constitute higher synthetical products, is to believe in metaphysical creations. There can be no synthesis of separate energies without a medium of composition. There can be no synthesis of qualitatively disparate energies without a medium in which such qualitative combinations are structurally realised.

I will magnanimously refrain from picturing the grotesque outcomes of the supposition of a hypervital medium of sensory and motor combinations. I will merely point out the solution of this central enigma, a solution clearly indicated by the logic of biological principles. I was, however, not so fortunate as to discover it by the convenient process of deductive reasoning. It was the diligent study of the living substance of morphologically unorganised beings, uninterruptedly pursued for years, that first led me to assume by way of analogy, also in the most complex forms of life, a homogeneous substratum of highest vital activity. Such a substratum would constitute a proper medium for the composition of specific energies, a medium in which the combined value of sensory elements has ever been, and is still being, molecularly established. Manifold physio-

logical and psychological considerations have since added strength to this empirical inference.

Even strict logical consistency would desiderate such a synthetical substratum. If, namely, sensory activities of an elementary kind are found to be molecularly realised in certain structural regions, then surely the combined or blended resultants of such elementary activities must also exist molecularly realised in certain more central regions, where numbers of sensory elements ultimately lose themselves in one common medium. If it is the substratum of nerve-elements which gives sensorial value to the stimulated commotion, excited from outside, then surely it must be some similar, only much higher, substratum which gives sensorial value to the combined energies of these elementary stimulations. If it is at all due to the inherent molecular constitution of the material filling the sensory elements that a sensorial import is imparted to the stimulating rhythm, then surely it must also be due to the inherent molecular constitution of a material occupying central positions that a complex sensorial import is imparted to combinations of stimulating rhythms. These reflections, however consistent apparently, would amount to very little, indeed to nothing, if the desiderated substratum were not actually there, *in situ*, just where needed. Sensory elements all terminate in reality in a large mass of homogeneous material, and motor elements all emerge from the same coherent substratum. Only theoretical prejudices, arising partly from a blind faith in the tenets of the cell-theory, partly from the strangeness of attributing highest functional activities to morphologically unshaped material, have hitherto prevented physiologists from acknowledging the neural efficacy of the substratum which in all reality accomplishes the structural intercommunication between the sensory and the motor systems, and in which the compounding of elementary nervous activities must inevitably occur. Isolated opinions, prompted by considerations of a different kind, have from time to time pronounced in favour of the neural nature of Neuroglia. But among physiologists in general this structural climax of all organisation, instead of being esteemed the precious embodiment of nerve-essence, is looked upon as mere nerve-cement. I venture, however, to state that no candid histologist, versed in the examination of unadulterated and untortured tissues, would insist on the accepted connective-tissue-nature of neuroglia. Even its granulated appearance is a *post-mortem* occurrence. Indeed, chemistry has already succeeded in demonstrating essential differences between unmistakable connective-tissue and this morphologically unquestionable central substance.

Some observers maintain that almost the entire neuroglia is

composed of a network of intercommunications between nerve-elements.[1] Meynert, however, has pointed out that the neuroglia cannot possibly be the exclusive product of textural intercommunications, as it relatively preponderates in animals in which fewer nerve-elements are present.

Unless the conception of inherent sensibility be altogether abandoned, Neuroglia will henceforth have to be considered the medium in which the synthesis of elementary neural activities takes place. This supreme synthesis can, however, be accomplished only by means of organised specific energies, by means of a structural composition, in which the compound value of the sundry elementary activities is realised.

This momentous conclusion follows, as has here been shown, very naturally from already well-established biological principles. But, as I have said, it was first attained by me as an empirical corollary of vital manifestations discovered in protoplasm. I believe its recognition forms part of a view of life far more intelligible and profound, both physiologically and psychologically, than the views generally accepted.

III.

I owe one more explanation before this chapter of my great theme can be satisfactorily concluded.

Like many other writers, I had to assume throughout an exact concomitancy between sensory energies and the chemico-vital process occurring in certain neural structures. This

[1] There is current among histologists an ultra-mechanical view of ectodermic life, which deserves some notice. Max Schultze, one of the most accurate observers of unadulterated tissues, thought he had discovered a fibrillous composition of the so-called nerve-elements, nerve-fibres constituting vast bundles of primitive fibrils, and nerve-cells representing mere stations of redistribution instead of synthetical organs. The meshes of Gerlach's central network would thus consist of dishevelled primitive fibrils on their way to form direct communications near and far. The elements of the ultimate sensory network would only have to be continued into the elements of the initial motor network in order to complete the desired mechanism. The ectoderm would thus consist of a system of centrally tangled filaments, immeasurably slender, and stretching in unbroken continuity from the peripheral points of stimulation to the innervated organs.

I have never felt inclined to accept the genuine fibrillous composition of nerve-elements. Though I have not succeeded in gaining a view of living central nerve-cells, I have seen under the microscope the entire vast contents of still living muscular fibres of insects transformed in an instant into an exquisite fibrillous structure, of which the composing fibrils were immeasurably slender. The question, however, is definitely decided by Boll finding in torpedo, the very object to which M. Schultze attached most importance, the nerve-cells and fibres decidedly granular and not fibrillous; fibrils only appearing as a *post-mortem* change.

peculiar coincidence of sensation and motion in time and in space, forms, however, so strange a correlative event that it is felt by all thinkers to require some further elucidation. Indeed, even in the light of a two-sided phenomenon it constitutes a dualism which, with all the present pressure towards monism, has not yet been made to yield.

This burning question of inwardness and outwardness, of subjectivity and objectivity, has been so often darkened by volumes of subtly-woven words that the briefest and most matter-of-fact explication will perhaps prove all the more appropriate.

We imagine again our ectodermic filament in which the sensory-motor enigma rests incorporated. It begins as a sensory nerve, and ends as a contracting fibre. Only we find interpolated at some part of its continuous course the synthetical substance, the neuroglia. On stimulation there are intrinsic motions started at the peripheral end, and propagated along the entire stretch of its material. However much the motions may vary in kind in the different parts of the filament, they all partake of the same motor nature, they are all motions of some kind. They are all really perceived as such, or, at least, conceived as actually occurring. This fact, critically considered, means that the chemico-vital process taking place anywhere in the filament is capable of awakening in a spectator the feeling of motion. The motions thus perceived by an outside observer are clearly special kinds of feeling aroused in him by special kinds of stimulation. The stimulating power is the power emanating from the filament; the stimulated energy, *i.e.*, the movement perceived in consequence, is, however, a power called forth in the spectator. It is the display of a liberated force pre-existing in him. Now, it happens under certain very definite organic conditions that the same energy which emanates from the neural process of one organism and which stimulates another organism to the feeling of motion,—it happens that this self-same energy is also being felt in some specific manner by the organism in which it arises. For instance, the chemico-vital process occurring on stimulation in the optic tract of some animal would, if made accessible to sight, be perceived by an observer as a molecular motion of a particular kind, whilst at the same time the organism in which the process occurs would itself experience some optic sensation—colour, extension, and so on. The same process, which under peculiar conditions may mean immediate sensation to the organism in which it takes place, has also the power of mediately awakening sensations of motion in other organisms.

I must confess that, surveying the field all round, I am at a loss to detect anywhere a trace of the dualism so emphatically recognised by the scientific philosophers of our time. The entire

sphere of experience is wholly made up of sensations, only sensation sometimes in one sentient focus and sensation sometimes in another. That which is sound to my hearing may be motion to my sight, or to the sight of some other being. But motion and sound are both alike sensations of some organism.

The power of stimulating sensations is co-extensive with the outside world at large. The power of experiencing sensations is restricted to the sentient foci of animals. But the molecular constitution, which renders a tissue sensitive, and at last sentient, is the result of gradual development, by which fact is indicated that the peculiar potency which, fully developed, discloses itself as sentience must also be possessed in inferior degrees by the entire molecular scale that, by evolutional elaboration, has led up to the compound, representing the substratum of complex sensation.

Sensations, in one sense, are all objective, for they are all stimulated. In another sense they are all subjective, for they all occur in individual organisms. Only there exists a broad distinction between sensations attuned to stimuli emanating from sources outside the feeling organism, and sensations attuned to stimuli arising in tissues forming part of the feeling organism.

The individual organism is everywhere the centralising and realising agent.

The current of knowledge has hitherto been from the inorganic to the organic. The cultivation of the science of inanimate nature has led to a more complete understanding of the phenomena of vitality. In future, the current will be reversed. Inorganic nature will receive a deeper significance through the application of laws derived from the study of organic nature.

The specific energies of nerve-structures, the existence of a substratum of compound sensation, and the essential identity of sensation and motion are biological and philosophical truths sufficiently definite and decisive in themselves; but they admit of a still more profound elucidation from a standpoint embracing the totality of animal organisation—a standpoint from which the unity of the organic individual and the substantiality of life will become evident actualities. I hope to be able, in future contributions, to expound these great and as yet unformulated doctrines of philosophical biology.

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II.—DETERMINISM AND DUTY.

Accompanying an intellectual acceptance of the Evolution-theory as affording the truest interpretation yet given of the facts of existence, there tends to arise in many minds a dread of certain practical moral consequences supposed to be incident to the spread of the doctrine. Misgivings are constantly expressed lest a conviction of the truth of the great modern hypothesis, in its sociological application especially, should be attended by the outgrowth of a fatalism so pronounced as to tend, more or less, to retard human progress, through the chilling of enthusiasm, the dwarfing of aspiration and the paralysing of endeavour.

The admission that human society, as a whole, has been "evolved" in a definite and uniform manner, analogous to the manner of development of an individual organism, is seen to point *by implication* at necessary causes or conditions governing the origination and workings of volition, since volition is the spring of the conscious acts of individuals composing society. Hence what becomes of "free-will"?

Nor is the doctrine of social evolution the only means by which science throws discredit on the idea of spontaneous volition. Modern physiological research brings to light facts favouring a theory of "Animal Automatism"; and shows consciousness, according to one view, as the mere "symbol" and "concomitant," and, according to another view, as the subjective equivalent, of a cerebral state. This cerebral state depends obviously on further physical conditions, which conditions are often, themselves, demonstrably of other than voluntary production, and are at the mercy of general physiological "laws". Thus is corroborated from another standpoint an apparently fatalistic view of human affairs, even in the cases where individual or social action visibly emerges as the consequent of, and visibly depends for its direction upon, the character of individual human wills. So it happens that some persons, even while admitting that there is a grave appearance of truth in the conclusions of science, yet deprecate the necessarian doctrine which seems to be involved in them, as "paralysing" and "discouraging"; and even find in its implications some undefined reason for doubting the efficacy of individual effort to promote social welfare. Such persons not unnaturally look forward with apprehension to the possible ultimate acceptance of evolutional doctrine by masses of men; and even while holding it to be the truest they can formulate, they seem to lose faith in the tutorship of fact, and to suspect that they have at last

found a case in which ignorance may be, if not absolutely beneficial, at least safe and harmless.

These apprehensions, however, appear to me to be founded on a certain misconception of what really is and is not involved in the question of free-will. And this misconception in turn arises from an ill-considered use of terms, which, when applied as we are wont to apply them, react on the ideas they rather cloud than express, to the confusion of the whole argument.

The aim of the present paper is, in the first place, to point out where this misconception lies; secondly, to discuss how much the *reality* and the *value* of the belief in free-will really amounts to; and further, to give reasons for presuming that such "fatalism" as is warranted by science, so far from operating unfavourably on the motives or energies of its believer, tends, or may tend, to influence him beneficially, and to render him a *more* and not *less* efficient agent in the promotion of human welfare.

I. It is commonly assumed by those who enter into the discussion of free-will that there exists a mysterious contradiction between the scientific conception of undeviating natural processes, and certain immediate *dicta* of consciousness concerning volition. This assumption is, however, gratuitous, and arises, as I believe, from the use of the ill-fitted words which we import into the discussion. There is no contradiction, names apart, between the deductions of science and the immediate deliverance of consciousness on this head. What science asserts generally is the indissoluble nature of the relation between cause and effect. Applying this general thesis to the particular case of volition, we merely affirm that each volition is dependent for its origination and its impetus on given antecedents, which may be within or without the field of immediate consciousness. On the other hand, what consciousness asserts is the connexion of our act with our will; which connexion no affirmation of science —least of all that which hints at the identity of will with cerebral conditions—even tends to discredit. Consciousness asserts that we *do* as we *will*. Science asserts that we *will* as we *must;* and these two propositions, so far from being contradictory or even antithetical, are perfectly consistent with one another, and with the general doctrine of invariable causation.

Yet in argument we perpetually find the *freedom* of the will confounded with the *existence* of the will; and the voluntariness of action confounded with its dissociation from an endless and complex preceding chain of causes. Neither speaker nor listener, writer nor reader, perceives the error. Meanwhile the words used react on the ideas, and on their own further significance: and the argument flounders on its way into quicksands,

not of mystery, but of most illogical nonsense. If in every case we were to say "voluntary action" for "free-will," this would immediately appear; for it is our power of voluntary action—of doing as we intend to do—that men stickle for, I imagine, rather than the absolving of the will from all conditions of its impulses. It is the former and not the latter which at any rate gives their meaning to such words as "education," "government," "influence," "persuasion," and "responsibility".

If we analyse the utterances of those persons who repudiate scientific determinism on the ground of its supposed moral hurtfulness, we shall repeatedly find them accusing determinists of denying the reality of the human will. They speak alternately and indifferently of *will* and of *free-will* as if the terms were interchangeable, or the distinction between them unimportant to the argument. Having made this first step into confusion, a second commonly follows. Not only is the undisputed existence of what we know as "will" verbally confounded with its disputed spontaneity, but this disputed spontaneity of will is further confused with undisputed voluntariness of conduct. What wonder that the argument often concludes with a bewildered shake of the head, and an attempt to regard the matter as if there lurked about it the same "mysteriousness" as that which, from the very constitution of consciousness, shrouds all speculation concerning, say, the infinite divisibility of matter, or the boundlessness of space?

What I desire to point out is that, after all, the testimony in favour of determinism does not necessarily gainsay the belief that will (whatever be the conditions of its production), *as will*, contributes to action; and that so we act, or refrain, *as we choose*. All it does gainsay is, that the choice—the volition which prompted such act or forbearance—was, itself, its own originator, and independent for its existence, strength or direction of that undeviating process of things which we call law. After all, who contends for more than an admission that when we act consciously we act as we will? Who cares to deny that this or that circumstance or predisposition influences the desire that prompts to action? So stated, the reprehended fatalism reads very like a set of truisms, as universally believed as they are innocuous and pointless.

But, so far from conceding anything as to the real spontaneity of volition, I believe that these apparent truisms—that we act as we desire, and that we desire as circumstances and individual disposition combined lead and permit us to desire—are the forms in which we are all wont to express our real disbelief in free-will. Will is fixed midway between that which sets it up, and that which, when set up, it needs must accomplish, within

or without the willing organism. We do as we choose. We choose as—being ourselves, and circumstanced in a given way—we must. And in this light, which is the right light in which to view the bogey, it is well if it appear no bogey at all, but only a very familiar though unchristened acquaintance by whose rule we live day by day.

Yet, though we may live and prosper day by day on principles unconsciously held—woven by inherited and individual experience into our nature, and so instinctively followed in the main—the beneficent effects of any such principle are doubled in depth, in directness and in fruitfulness, when the principle dawns into consciousness and becomes a recognised and realised fulcrum to steady our motives on. Only when a thing is perceived—consciously differentiated from what it is *not*—can it become a power capable of stirring emotion; hence, of modifying volition; and hence, of directing consistent action. We must occasionally walk round and round our truisms and see what they amount to. It is not labour lost if a shred of mist get swept from the mind by the way; if a single life-principle thereby receive added vindication, or a single "law of nature" be once more proved consistent with itself. The full title to our unvarying and earnest deference of that old acquaintance, whose behest we obey as well as we can whenever we are reasonable, is only acknowledged after we have recognised that its real name is Necessity.

II. Preparatory to considering the bearing of fatalistic convictions on life, conduct, or progress, it may be well to examine what the so-called belief in *free*-will which is commonly opposed to such convictions really amounts to. That this belief is neither so definite, so confirmed, nor, consequently, so influential as its advocates allege, may be inferred from the shadowy character of the arguments by which it fortifies itself. Beliefs which are permanently needful, alike to the safe conduct and the progress of human life, are of two kinds. They are either the conscious affirmation of direct perceptions, as the belief in sunshine when one sees it, or they are realised intelligent convictions concerning some relation between things and result from a process of reasoning upon observed facts. Such is the belief that sunshine is an agency in ripening fruit. Of this kind also is the belief that acts performed by us, and corresponding with the volitions we are conscious of entertaining, are related to those volitions, and that the relationship is one of cause and effect. These beliefs are grounded upon invariable experience, and could we practically slight them life would, of course, quickly come to a standstill. If we have any evidence that the belief in *free*-will is of the same character, we are

justified in dreading—or, to speak more rationally, in denying—the possibility of its annihilation by scientific theories.

As to the first of these two types of belief, I think we have no reason for regarding the belief in free-will as an intuition. All that consciousness takes immediate note of is actual existence as represented in present feeling: abstract propositions, relating to the connexion or disconnexion of such feeling with antecedents, require several mental acts successively performed. What we immediately perceive in the case of volition is its *existence*, not its *origin*—the fact that we will this or that, not how we came to will it. At the moment of willing to move my pen across this page, I am wholly unconscious of the connexion or disconnexion of my will to do so with conditioning antecedents. To arrive at *any* conclusion on the matter I must *re*-view my mental experience; and the conclusion reached is thus shown to be a matter of reasoning.

Intuition apart, what is the *rationale* of the vague feeling of freedom which has given rise to the belief in free-will? May it not be an illusive result of our power of inferring the future from the past? We recognise in ourselves the capability of being, to some extent and in a certain sense, indirectly acted upon by the future—that is, by what *is not*—that is, by *nothing*. Our power, based on memory of past experience, of forecasting events permits us to have wishes concerning what has not yet happened: these wishes modify our present conduct, and we feel as if such actions were the result of a literally spontaneous volition with nothing behind it. While actions based on a purposing volition *seem* to the agent to be based on what at the time *is not*, namely, on his state, or the state of something else at a future moment, what they really *are* based on is a present inference that the future will be like the present, which is in turn based on the consciousness that the present *is* like the past.

Whether this be anything like a true account of the vague feeling above alluded to, or whether the latter be always—as it certainly is sometimes—nothing more than the inexact reference consciousness makes to that real liberty of *acting as we choose* so constantly experienced, the certainty remains that no real belief in *free*-will can be of the nature of immediate intuition. If a distinct belief that the origin of volition is spontaneous (in the sense of being uncaused, or self-caused) be reached at all, it must be as a realised intellectual conviction, the result of a more or less extended process of reasoning.

Here the advocates of the belief in question are met by the discouraging fact that every step hitherto made in the investigation of the laws of volition tends towards the discovery of its dependent character. Nay, the very admission that conscious-

ness (of which will is a form) is governed by laws at all, virtually contains a denial of the self-determining nature of volitional impulses.

Comte, apparently sharing the wide-spread repugnance to necessitarian belief, vindicates his philosophy from the charge of fatalism on the ground that "all phenomena . . . admit of being modified in their secondary relations, and this the more as they are the more complicated": and further, that social phenomena "admit of larger modification than any others, and that chiefly by our own intervention".[1] The last clause quoted, implying as it does the efficiency of human will in modifying social phenomena, leaves untouched the question as to what modifies will itself, and affords another instance of the strange oversight by which in nearly all discussions on this subject propositions are advanced wide of the mark that neither prove nor disprove anything. What Comte means to affirm in reference to social phenomena, and what many others mean who use this argument of modifiability in reference to the will, is, I suppose, this—that the condition regulating the phenomena under examination are exceedingly complex and exceedingly subtle, and that the number and variety of things and circumstances capable of effecting modification are inconceivable; and that so, the possibilities of modification being practically infinite, the society, or the will, is practically free.

This argument, however, goes no way towards negativing a doctrine of necessity. For it must be borne in mind that even infinite modifiability is not freedom, is not even of the nature of freedom. To admit of modification is still to be at the disposal of modifying agencies. That *any* thing *may* modify volition is true enough in the abstract. It is true in reference to will in general, things in general, and time in general. What we have to remember here is that wills exist individually, that time is practically a single stream of successive moments, and that the sum of things constituting the conditions of a given volition at a given moment results in *one modification only*, which, in occurring, excludes all others; and that so, of all conceivable modifications, only that *one* occurs which the actual set of factors, antecedent and co-existent, renders at once possible and necessary. Infinite capability of modification does not, in short, imply any possibility of escape from one particular set of modifying agencies at any given moment of conscious existence, *of which set of agencies the will has at that moment no share in the selection.*

But those who maintain that the social changes constituting

[1] *General View of Positivism*, translated by J. H. Bridges, pp. 57, 58.

progress are of a character transcending natural law, and are un-necessitated in virtue of their being mainly brought about through voluntary human agency, are apt to overlook this. It is of the small, ever-recurring, and necessarily-modified volitions that the conscious life of every individual is made up; his conscious life including all his voluntary actions as well as the motives (distinctly or indistinctly recognised) by which his conduct, moral, social, and political, is regulated.

If we assert that each moment separately is the determined and natural outcome of the moments preceding it, we must assert the same of a lifetime made up of such moments. And what we say of the life of an individual, we must also say of that social whole made up of multitudes of such individuals. It is only a question of relative complexity. If the modifications from countless extraneous and organic causes to which any given will is subject be, as they truly are, inconceivable in number and complexity, no wonder that we sometimes lose all sense of the fact that each modification as it occurs does so of necessity; and in grouping larger numbers of such modifications into, say, a year's life, we find it even more difficult to realise that of all the various acts, words, and thoughts, not one was free to arise or to work, to be dispelled or to remain inactive, apart from its connexion with a determining and equally unfree antecedent. More complex again are the social phenomena made of the welded lives of millions.

Fortunately for us, the freedom of the will is no requisite of progress. Could we rightly see all that such freedom would imply, we should perceive that, in our present condition of ignorance at least, such freedom would be fatal to the continuance of society at all.

III. The question next arises, Does the abandonment of belief in *free*-will involve, either logically or practically, the abandonment of belief in human instrumentality as able to forward human wellbeing? To affirm that it does is surely to draw a most inexact inference. The power of men's voluntary efforts to achieve their ends does not depend on the dissociation of the volition prompting the effort from antecedents, but on the exactness with which such effort, when made, conforms to the laws regulating the things with which the volition concerns itself. Whenever a man's will is at one with the constitution of things he wills about, we may say that he *does* accelerate the arrival of the end he desires. His will is a new and powerful factor added to all the other factors already at work at the inevitable; and there is half a truth in the assertion that things run their appointed course the faster for its co-operation. But the degree in which his will so conforms is not a matter of his own deter-

mination. Its conformity depends on his knowledge of the conditions with which his forthcoming act will deal, and this knowledge is the outcome of the whole array of his past individual experiences. No less does the conformity depend on his power of applying, and his disposition to apply these lessons of experience; and this power and disposition have been settled for him by the incalculably longer array of ancestral experiences. To desire the conditions of social happiness, to know exactly what those conditions are, and to be able directly or indirectly to supply them is to possess mastery over those conditions. With these three forms of power, the moral, the intellectual, and the physical, the process of evolution has already to some small extent supplied us. But as yet we are not fully equal to the task of improving society by *direct* voluntary agency. The phenomena are too complex for our present powers. The *whole* of the natural force needed for the improvement of our race does *not yet* flow through the channel of human will. Meanwhile things do not stand still. While our imperfect adaptation to social requirements is shown in the frequent errors our volitions lead us to commit (even with the best intentions), the forces which have originated society are not idle at the work of its advancement. Though slowly and indirectly, they work through our very errors; since the gradual rectification of errors by their own natural reaction eventually brings about the inevitable improvement.

There is no escaping the conclusion that the future is as fixed and certain as if it were already past. The very belief in the fixity of law and the unbrokenness of causation, which is the ground of all our hopes, and which underlies and makes possible every volition, is also, when duly considered, tantamount to a belief in a future destination as certain, though not as certainly known, as the actual present. The subjunctive mood is the language of our ignorance. We need it to express our guesses, but it conforms not at all to the mode of actual being. However many ways we may beforehand imagine possibility may run, there *will* be only one way, and for that way things are already —nay, have ever been—in train.

We believe this practically every minute we live, concerning everything of which we have real knowledge. If I see a lighted match thrown among combustibles, I know that, other things equal, a conflagration must ensue. If I modify this statement with an "unless, or an "if," I don't imply any uncertainty in the actual issue, but merely *my own ignorance* as to whether the conditions necessary to check the conflagration are or are not forthcoming. The future as a whole, as well as in

detail, will be one thing and not another. Progress is single-streamed. Things only happen once. They *do* happen, and in happening exclude from the region of fact all "woulds" and "mights". On the aggregate *set* of human wills at the present moment depends the aggregate future effect of the special actions in which they are tending to issue. This is "fatalism?" But persons who shrink from its acceptance, or deprecate its promulgation as a truth, must surely be adding to the conception of "fate" something more than it necessarily contains. They must be assuming a conscious doggedness, or at least a callousness, somewhere hidden away among the impersonal forces at work around them, or they would not trust those forces so little. Past experience—and I use the word in its largest sense—should teach them better. This array of dogged and callous "laws" and forces is precisely that to which we owe our own distinctive powers. In their working they long ago "evolved" human consciousness, of which will is a form; and in the course of numberless generations they have at last brought within the range of that consciousness some of the conditions of its own amelioration. They will continue to work through consciousness increasingly henceforward; for it seems to be a rule that the highest faculty—that faculty which has taken most "evolving" to bring it into play—is ever that which is eventually employed as the chief instrument in the evolution of that which lies yet beyond it. This is exemplified in the fact that sight, when evolved out of mere tactual sensation, does the same work for the organism, and does it *better* than mere sensation: directing the creature in its escape from harmful influences, and in its search for things needful for its sustenance and general welfare. Intelligence is a vast improvement on instinct. That growing perception of the source and end of morals which answers to moral *sight* is a vast advance on the indefinite and blind moral *sense* which has for ages done duty for it, and when intelligence and intelligent morality have sufficiently long struggled with opposing circumstances to approach perfection, then and not sooner will that will, which, without too much straining of language, we may call their appropriate "organ," be competent to receive and transmit most of the forces needed for the next step forward. In other words, when the conditions of wellbeing are fully known and rightly balanced by the understanding, then and not sooner will voluntary exertion be the instrument exclusively employed in attaining social ends.

Thus we find it is one thing to deny the freedom of the will: quite another to deny its activity as a factor in human advancement. I think we are justified in accounting conscious effort to

be the appropriate effect of volition. For in so far as an act or a series of acts, accompanied by that form of consciousness we recognise as volition, while *inwardly* felt as effort of will, is invariably observed *outwardly* to differ in force, directness, and coherence from an act, or a series of acts, not so accompanied, so far are we by the laws of thought compelled to infer the necessity of that *accompaniment* as a specific factor, to effect that *difference* which is the specific product: to infer, in short, that will is, like everything else, needed for the achievement of its own result.

Will leading to action is one of the admitted means by which the progress of society has been secured. Things having been as they have been (the operation of human will on human action included), the affairs of mankind have shown a progressive tendency. The cessation of voluntary endeavour would be the cessation of what has, to say the least, constantly accompanied progress. Has any consistent believer in continuous causation, then, a right to assume that this constant accompaniment can be waived, and all go on as before? that what has happened will continue to happen under unlike conditions? Till it be proved that human endeavour has done more harm than good, till it be proved that this preponderance of harm is on the increase, and that the manifold experiences conscious effort has brought have made men less and not more consentaneous with Nature's method, we must assume the needfulness of such conscious effort as one of the many means by which the increase of social well-being is secured. The more clearly universal history shows us the coincidence of human improvement with human endeavour, the stronger must the tendency become to make the endeavour when we desire the improvement. The will is not free to remain unaffected by a dictum of history any more than by anything else recognised as true: and if the wish for anything be coupled with a just knowledge of how it has hitherto been attained, the consequence will be the putting forth anew of the energy which has before been proved successful. The fact that we consciously co-operate in the necessary working of the law we live by does not surely nullify either the consciousness or the law. When a man sees—what after all is there before he sees it—that whatever he does produces an effect of one necessary kind, a factor is added, calculated to render his acts effective and their effect such as he aims at. For such realisation itself modifies the man's will, disposing him to act in conformity with such knowledge as he possesses of the conditions regulating what he wills about, and so far as he judges truly of those conditions, he will act rightly.

This seems self-evident. But that it is not wholly unneces-

sary to insist, as a matter of theory, on the real influence of will on conduct is shown by the readiness with which the advocates of a belief in free-will assume that, along with the freedom of the will, its efficiency is denied by their opponents. The truth is that part of the non-freedom of the will consists in its being bound up with a consequent no less than with an antecedent; the existence of a volition involving no less the succeeding mode of existence or action of which it is itself a condition than it is itself involved in the sum of pre-existing and co-existent conditions which necessitate its own origination. It matters little, except as theory, whether we call the will a "symbol" always "accompanying" given molecular changes in the brain, or whether we reverse the terms, or whether we adopt the third and (it seems to me) most tenable hypothesis, which—repudiating the terms "symbol" and "accompaniment" as inadequate or misleading—regards the will, and that cerebral state always attending it, as an identical phenomenon under different aspects. The facts, however we theorise on their origination, remain for all present purposes the same. Given will, and a certain sequence follows, exactly corresponding as "effect" with will as "cause".

As to the arguments drawn from the phenomena of social development, I am not aware that any of them deny or render doubtful the necessity of those activities we recognise as voluntary in the achievement of social welfare. Neither is it evident that a belief in the necessary origin of the effort which achieves good lessens that *desire for good* which *prompts the effort.* While, on the one hand, the various arguments put forward to show that the amelioration of society has been, directly or indirectly, brought about by human endeavours consciously directed to secure that end, while these arguments do not negative the just application of the theory of evolution to social phenomena; yet, on the other hand, a doctrine setting forth the slow and inevitable evolution of that human will which has so largely contributed to the progress of mankind, in no way lessens the practical value of the voluntary moral and social efforts which are its natural outcome.

Those who fear that belief in the necessary character of volition, and in the parallel doctrine of the inevitable nature of progress, is likely to paralyse moral effort, may be asked the following questions :—

(1) Do not those conscious acts of ours which we recognise as efforts, often produce those results which we recognise as gains in welfare ?

(2) Does a conviction that certain means have attained certain

ends lessen our faith in those means, or hinder our alacrity in employing them when we seek those ends ?

(3) What reason is there for assuming that a perception of the law by which human ends are gradually worked out, will lessen that desire for wellbeing, or that uneasiness in its absence which has been one of the chief instruments of increased welfare, in the stimulation of action through volition ?

The conviction that the all-powerful "laws of nature," are working through our own wills at the (now conscious) evolution of our ascending race, is surely more effort-inspiring and more encouraging than is the opposite belief that a multitude of purblind individuals are waging unequal war with universal law; which law they only very partially understand, and which, without such sorry *opposition* as human ignorance can make, would infallibly drift mankind backward into barbarism and ruin.

Lastly, we must surely consider deeply before we decide that we are face to face with such an unprecedented anomaly as a pernicious truth, concerning which ignorance or denial is likely to be desirable. If a thing is true, a man or a community must surely be the better for knowing it, because the wiser. It must be easier to adjust conduct to the sum of surrounding conditions when a new fact or a new law—that is, a new condition—becomes manifest. If our volitions are necessitated—each as it arises—then by all means let us know it; that we may see with added clearness how important is the discovery of all things which tend to direct it rightly; and that, so seeing, our wish may be such as to result in the right (*i.e.*, nature-rewarded) measures whenever we aim at the attainment of any end that lies on the other side of a human will. Could all the dutiful persons in the world become consistently "fatalistic,"—could a conviction permeate the moral portion of society that, though right willing is a condition of right action, or even right disposition to action, it remains no less certain that given conditions are necessary to the origination of this right willing,—I believe the improvement of our condition would be then and there accelerated. For such a conviction could not but result in an earnest adherence to such of the physical and psychical laws governing the origination of impulse as are known, and an equally earnest search for such as are not yet discovered. So long as will tends to action or, which amounts to the same thing, so long as the will's inseparable condition of brain tends to action, and so long as such action differs in directness from purely unintentional action, the progress of life can hardly be retarded by a recognition of what the conditions of will or of that brain-state really are. Only when we have admitted and realised that volition does invariably conform to law can we

consistently set about operating on it, so as voluntarily to influence life and deed through its agency. Our belief in education, and in government by reward and penalty, indicates our *practical* belief in determinism; all that modern philosophy does is to prop practice by theory.

No dismay need attend the conception of inexorable conditions governing the will when we recollect how far those conditions have already brought us. Comparing the condition and life of a modern intellectual person, or the condition of the society in which such persons are numerous, with the semi-conscious existence of a struggling barbarian, we may gladly concede with Mr. Spencer that "freedom of the will, did it exist, would be at variance with the beneficent necessity displayed in the evolution of the correspondence between the organism and its environment": seeing that, since the means by which life becomes higher and happiness greater is the gradual moulding of inner relations by outer relations, "the harmony at any moment existing would be disturbed, and the advance to a higher harmony impeded," "were the inner relations partly determined by some other agency:" and that so there would result "a retardation of that grand progress which is bearing Humanity onwards to a higher intelligence and a nobler character."

He who would largely influence for good, *i.e.*, for liberty, his own destiny or that of posterity must first be the intelligent pupil of experience, and so the (consciously or unconsciously) acquiescent servant of the "inexorable". If a man is ever to be master of his fate he must first know, with a knowledge transcending all his present powers, what are the laws regulating the infinitely complex conditions of his own well-being; and then he must *obey* those laws with a docility and a consistency at present undreamt of even by philosophy.

Meanwhile the knowledge we have does not lead us to assert the vanity and uncertainty of all human effort, but only on one side the failure of human mistake, and on the other the certain success of human rectitude. Human mastery over human fate increases day by day. It is *part* of human fate that it should do so. We cannot *not* learn by experience: we cannot see given results, good or bad, follow given acts without having our will concerning future acts of the same character modified henceforward; though of course the action of observed facts on the will depends in each individual case for its degree of force, clearness, and permanence on the higher or lower stage of organisation reached. The learning by experience is most sure and most rapid in the highest intelligence; and here again is an instance of the beneficent way nature plays into her own hands. For the most competent persons—those persons, that is, who best

understand how to re-apply experience—are ever the most certain to do so: and their acts, good or bad, being more consistent and more frequently repeated, more organised and more law-rewarded, ever tend to deepen and widen that "line of least resistance" along which mankind is at once impelled and attracted to its own ennoblement. The higher the organisation the keener is the awareness and the greater the power of effecting what we may—for the nonce—call self-modification. To understand Nature's economy is to fall in with it and see the vanity of attempting any other plans than those marked out for us in the chart of possibility. Thus to believe is perhaps to abandon impatient hopes of great achievement in one's own lifetime, or through one's own personal instrumentality; but it is to see also that nothing could in the nature of things have been gained by *not* abandoning them, since they were waste of steam. We learn to husband our resources and to spend them on the principles set us by necessity. Still, what was but a hope before becomes an increasingly confirmed security when once we are so awake to the unfailing and inexorable nature of causation as the necessary growth of one thing out of another, as to trace its impersonal working in the affairs of personal conduct. The promise of the inevitable reward which universal law will bestow on the smallest rightly-guided action (which reward shall be reaped in kind either by oneself or by others for whom one labours) raises the moral importance of the most inconspicuous deed or most passing word from the level of trifles to that of "efficient causes". Moreover, the frame of mind which is indirectly induced in a morally disposed person by an acceptance and practice of the principle of Necessity is of that noblest of all conceivable types—the self-bestowing, the super-personal.

To sum up: (1) The bogey men make of their own ill-fitted words tends to vanish altogether when those words are replaced by the thoughts they represent. To deny the self-creative power of volitional impulses is seen not to imply a denial of the useful character of the acts and efforts based on those impulses. To affirm that volition depends for its existence on an uneasiness set up in the organism by some faulty adaptation of its present circumstances to its present functions is also seen to leave the cause of any such uneasiness what it was, and therefore to leave the conditions involving "aspiration" unaffected, at least so long as human life is felt by human beings to be short of perfection.

(2) Starting from the assumption that beliefs which are necessary to the conduct and progress of life are mostly either instant and intuitive perceptions (such as belief in sunshine

when one sees it, or belief in will when one feels it), or else are recognised and realised connexions of cause with effect (such as that belief which attributes the ripening of fruit *in part* to the agency of sunshine, and the attainment of a distant end *in part* to the action of our will on our intervening conduct), it appears that the belief in the spontaneous nature of volition, being neither of the former nor the latter type, may be beforehand supposed unnecessary to the proper conduct of human affairs. This conclusion is reinforced when we discover that the abstraction of the so-called belief leaves the real springs of effort untouched, and human capabilities of "mastering" circumstances precisely what they were.

(3) The spread of a scientifically-warranted fatalism need not be dreaded by any persons who believe in its truth. A true belief in a sane mind works infallibly, and works for good.

Much good is done by right naming, and many things in the conduct of thought and of life may be beneficially affected when the inseparable connexion subsisting between our conscious lives and the rest of nature is recognised. As Emerson says, "If Fate is ore and quarry; if evil is good in the making; if limitation is power that shall be; if calamities, oppositions, and weights are wings and means—we are reconciled. *Fate involves the melioration.* No statement of the universe can have any soundness which does not admit its ascending effort."

If we are "fatalists," and at the same time have faith in the tutorship of experience as the means by which the gradual change we feel as progress is secured, we shall see futility nowhere; but even in those cases where a fervent effort fails of its intended end we shall recognise, both in the effort and in its failure, the beneficent working of that universal law by which impersonal nature perpetually sifts out her own shortcomings, and increases her own truth of aim. I say *impersonal* nature, thus seeming to beg the theological question, because the abounding signs of this general impersonality in the economy of nature are reinforced by the fact that, taking *life* as the consummation of *existence*, only some millionth or less part of things so fortuitously comports itself as to issue progressively, beneficently, or even coherently. The discouragement this fact suggests may be, however, for us who *do* live, balanced by the further fact that (given the absence of any opposing, clumsy, shiftless, or maleficent personal power) the successful millionth of lifeward occurrence gathers, and *must* gather, as it goes; and, eventuating in conscious volition, must bring ever more and more of nature under its purposive control. The conditions under which this life-power may be continuously maintained and increasingly attained, we call the "laws" of life. Which

"laws" as they come to be better known, and can be better co-operated with, must, for all we can conceive to the contrary, tide man onwards ever nearer to that happy and powerful something he is tending to be.

Knowledge is the rectifier of will: and each increment of truth, however severe its immediate implications, betters our condition. So far as the growing belief in the dependence of will on fixed conditions is the natural and normal outcome of a widening knowledge of things and relations, we must take it as itself part of our advance and trust. Our "fate" has hitherto been that "will" should be "evolved" in us, and that, when evolved, it should plunge us with added impetus into that struggle for individual and social amelioration in which life consists. At last comes the determinist, and avers that nature claims all these (rightly called) *voluntary* efforts of ours as her very own, and adds the promise to our hope of success for ever and in exact proportion to the exactness of our voluntary conformity to the laws of our own being and wellbeing.

In the severely merciful code which is the product of such a creed as this, while vengeance and impunity are alike shut out by the larger law of equity, there *tends* to grow up between each man and his fellows that spirit of "sweet reasonableness" which, in proportion as it prevails, further tends to land us, individually and collectively, in a completer welfare than any that our present sluggish aspirations enable us to imagine.

L. S. Bevington.

III.—SYMBOLICAL REASONING.

Symbolical reasoning may be said to have pretty much the same relation to ordinary reasoning that machine-labour has to manual labour. In the case of machine-labour we see some ingeniously contrived arrangement of wheels, levers, &c., producing with speed and facility results which the hands of man without such aid could only accomplish slowly and with difficulty, or which they would be utterly powerless to accomplish at all. In the case of symbolical reasoning we find in an analogous manner some regular system of rules and formulæ, easy to retain in the memory from their general symmetry and interdependence, economising or superseding the labour of the brain, and enabling any ordinary mind to obtain by simple mechanical processes results which would be beyond the reach of the strongest intellect if left entirely to its own resources.

The most striking achievements of symbolical reasoning are to be found in the various branches of pure and applied mathematics, and in short in all subjects of human inquiry that admit of more or less exact *measurement*. In all these the symbols employed represent numbers or ratios, or the various relations of numbers and ratios. Till within very recent times symbolical reasoning was exclusively restricted in its application to questions of this nature—questions to which the final practical answer was always an arithmetical expression.

The first person to show that symbolical reasoning might also be employed with advantage in the investigation of matters usually considered altogether beyond the sphere of mathematics was the late Professor Boole. This he did first in his *Mathematical Analysis of Logic*, and afterwards more fully in his celebrated *Laws of Thought*, published in 1854.

These works excited much admiration in the mathematical world, and, it may be added, caused no small trepidation among logicians, who saw their hitherto inviolate territory now for the first time invaded by a foreign power, and with weapons which they had but too much reason to dread. With these potent mysterious symbols mathematicians had already extended their dominion far and wide, whilst they, the successors of the illustrious Aristotle, had not added a single acre to the very restricted possessions bequeathed to them by their great predecessor. And now their aggressive rivals threatened to wrest from them these very possessions and annex the sacred province of logic also to the already over-grown empire of mathematics.

If the attack led by Prof. Boole had been vigorously followed up by his fellow-mathematicians, it might have gone hard with the logicians; but it was not thus followed up, and the logicians had therefore time to recover from their consternation. Ten years after, in 1864, Professor Jevons published his able treatise on[1] *Pure Logic* and in a skilfully planned attack regained possession of the ground which the invader had occupied with his symbols. He showed that the whole of Prof. Boole's results might have been obtained more briefly, as well as much more simply, from purely logical considerations, and with no more symbolism than logicians were already in the habit of using. Other champions, and notably Mr. A. J. Ellis, though a mathematician himself, soon followed and espoused the cause of logic against mathematics, each planting his own system like

[1] It may be here remarked that Prof. Jevons uses the expression *Pure Logic* in a somewhat different sense from that in which I use it further on in this paper.

a strong fortress where he thought it would most effectually protect the ancient and venerable science from future invasion.

The writer of this paper would like to contribute his humble share as a peacemaker between the two sciences, both of which he profoundly respects and admires. He would deprecate all idea of aggression or conquest on either side, and yet it is quite plain to him that the two cannot henceforth remain distinct and independent as they have hitherto done. Union for the future there must be; this is written in clear and indelible letters in the book of fate. But can there be no union without conquest and annexation? Would England be happier or more prosperous now if she had conquered and annexed Scotland, as she very nearly succeeded in doing in the reign of Edward I.? Would Scotland be freer or more contented if she had stubbornly rejected and resisted the act of union in the reign of Queen Anne? Do not Englishmen and Scotchmen alike now both "glory," as George III. said he did, "in the name of *Briton*"? Why should not logicians and mathematicians unite in like manner under some common appellation?

That logic, when treated symbolically, is capable of rendering important services to mathematics was shown by Prof. Boole in the latter portion of his *Laws of Thought*, in which he applies his method to certain classes of questions in mathematical probability. Quite recently I have myself shown in my papers on "Symbolical Language" published in the *Educational Times*, and much more fully in the first of my three papers on the "Calculus of Equivalent Statements," published in the *Proceedings of the London Mathematical Society*, that by the help of logic (treated symbolically) we may clear away with the greatest ease a complete jungle of difficulties which had vexatiously arrested the progress of mathematical science in a direction in which its cultivators were most eager to advance it. This jungle of difficulties presented itself in that part of the Integral Calculus which treats of the limits of multiple integrals, a subject which had occupied the attention of some of the most eminent mathematicians for the last fifty years or more, and which they had found extremely perplexing. In the "Calculus of Equivalent Statements" (as I have called my symbolical invention) logic presents the mathematician with an instrument at whose touch all these difficulties vanish. It is an instrument too of so simple a construction and so easy of application that a mere school-boy may speedily learn to use it. To give a detailed description of this invention is not my purpose. But I may be allowed to explain as clearly as I can, and with as few technicalities as possible, the elementary logical principles upon which it is based.

Such an explanation, discussing, as it will do to some extent, the fundamental rules of our ordinary reasoning, should, if I properly perform my work, possess some interest, not for the professed logician or mathematician merely, but for all educated readers.

Logic may conveniently be divided into two kinds, namely,[1] *Pure Logic* and *Applied Logic.* In a strictly analogous sense mathematicians usually distinguish between[1] *Pure Mathematics*, including geometry, algebra, the differential calculus, &c., and *Applied Mathematics*, which includes mechanics, optics, astronomy, and in short any science whose subject-matter is capable of more or less exact measurement or numerical calculation. And it is only from this point of view of measurement and numerical calculation that such sciences are in any way dependent upon mathematics. In optics, for example, there are many remarkable phenomena which not only may be explained very clearly without any aid from mathematics, but even exclude all mathematical considerations as irrelevant. It will conduce much to clearness of thought if we in like manner draw a distinct boundary line between *Pure* Logic and *Applied* Logic.

Pure Logic may be defined as the general science of reasoning considered in its most abstract sense, that is to say, as far as possible independently of any special subject of investigation. In other words, Pure Logic is the Science of Reasoning considered with reference to those general rules and principles of thinking which hold good whatever be the matter of thought.

Applied Logic may be simply defined as the application of the general rules of pure logic to *special subjects*, such as mathematics, physics, medicine, politics, or in fact anything (down to the most ordinary concerns of life) that offers any workable material for the human reason.

Reasoning again, whose fundamental rules and principles it is the business of logic to investigate and explain, may also be conveniently divided into two kinds, *mental* and *symbolical.*

In *mental* reasoning we dispense entirely with symbols, and in the dark and silent recesses of our own minds endeavour to evolve fresh knowledge from the knowledge already existing there. In this kind of reasoning all our outward senses are quiescent and we might still be capable of it even if we were blind, deaf and dumb, and unable to move hand or foot.

In *symbolical* reasoning, on the other hand, we use symbols as artificial aids to our naturally more or less defective memories.

[1] The adjectives *abstract* and *concrete* would be preferable to *pure* and *applied*, were it not for the fact that the expressions *pure mathematics* and *applied mathematics* are already established by usage.

These symbols may be divided into two kinds, *permanent* and *temporary*. By a *permanent* symbol I mean a symbol whose meaning is permanent or always the same. By a *temporary* symbol I mean a symbol to which we attach only a temporary meaning. Here again the science of mathematics supplies us with a useful analogy. In common arithmetic, in which the same symbol or collection of symbols always denotes the same number or ratio, we have examples of *permanent* symbols; and in algebra, in which the same letter or symbol may denote sometimes one number or ratio and sometimes another, we have examples of *temporary* symbols. In our common ordinary reasoning, in like manner, the same word or collection of words has always the same meaning; whereas in symbolical reasoning, the same letter or symbol may sometimes have one meaning and sometimes another. The analogy between the algebra of mathematics and the algebra of logic may be carried a step further. In both, *permanent* as well as *temporary* symbols are employed when convenient, and in both, the symbols of *relation*, such as $+$ and $\times$, are always permanent.

In my system of symbolical reasoning I have found it convenient to make my *temporary* symbols denote *statements*, while my *permanent* symbols, such as $+$, $\times$, $:$, usually denote the various relations in which these statements stand with respect to each other. That each individual temporary symbol, as well as every combination of such symbols, always denotes a *statement*, is one of the leading characteristics of my logical system, to the fuller explanation of which I now proceed.

Definition 1.—When two or more statements are made, each is called a *factor* of the *compound statement* which they collectively make up; and this whole compound statement is called a *multiple* of each separate factor, and the *product* of all the factors combined.

Thus, let a denote the statement "He is tall," let b denote the statement "He is dark," and let c denote the statement "He is a German". Then abc will denote "He is a tall, dark German". This compound statement abc is the *product* of the three factors a, b, c, and a *multiple* of any single factor a.

In the foregoing example the three statement-factors a, b, c refer all to one common subject; but this need not always be the case. For example, if a denote "His father is German," and b denote "His mother is French," then ab will denote the compound statement "His father is German and his mother is French".

This combination of factors into multiples may also, as in common algebra, be expressed by the symbol $\times$. Thus, the symbols abc and $a \times b \times c$ are equivalent.

Def. 2.—When a *disjunctive* statement is made, the several statements of which it is formed are called the *terms* of this statement; and, on the other hand, the disjunctive statement is called the *sum* of the terms. These terms are connected, as in mathematics, by the sign +. Thus, "He will go to Paris, Vienna, or Berlin, this summer," may be expressed by the disjunctive statement $a + b + c$, if we agree that the first term a denotes the statement "He will go to Paris this summer," that the second term b denotes the statement "He will go to Vienna this summer," and that the third term c denotes the statement "He will go to Berlin this summer".

The terms of a disjunctive statement do not necessarily refer (as in this example) to the same subject. For example, if a, b, c, respectively denote the three statements, "Henry will go to Paris," "Richard will go to Vienna," and "Robert will go to Berlin," then the symbol $a + b + c$ will denote the disjunctive statement "Henry will go to Paris, or else Richard will go to Vienna, or else Robert will go to Berlin". The disjunctive symbol $a + b + c$ asserts that *one* of the three events named will take place, but it makes no assertion as to whether or not *more than one* will take place.

In my papers in the *Educational Times* and in the *Proceedings of the Mathematical Society* these disjunctive statements are called *indeterminate statements.*

It is evident that in this algebra of statements the words *factor, multiple, product, sum,* and *term,* have not by any means the same meaning as in ordinary algebra; but there are some remarkable analogies which render it desirable and convenient to borrow these mathematical terms, instead of inventing new ones. The most remarkable of these analogies is to be found in the rule of multiplication, which is precisely the same in logic as in mathematics. In logic as in mathematics the product of the factors $a + b$ and $c + d$ is $ac + ad + bc + bd$, and the same rule holds good whatever be the number of factors, and whatever be the number of terms in the respective factors. Thus, if a, b, c, d, respectively denote the four statements "He will go to Aberdeen," "He will go to Brighton," "He will go to Chester," "He will go to Dublin," the expression $(a + b)(c + d)$ may be read "He will go either to Aberdeen or to Brighton, and he will also go either to Chester or to Dublin"; while the equivalent expression $ac + ad + bc + bd$ may be read "He will go to Aberdeen and to Chester, or else he will go to Aberdeen and to Dublin, or else he will go to Brighton and to Chester, or else he will go to Brighton and to Dublin".

Def. 3.—The symbol :, which may be read "implies," asserts

that *the statement following it must be true, provided the statement preceding it be true.*

Thus, the expression $a:b$ may be read "a implies b," or "If a is true, b must be true," or "Whenever a is true, b is also true". As a simple verbal illustration, let a denote the statement "He received the letter yesterday," and let b denote the statement "The letter was posted more than a week ago"; then the symbol $a:b$ may be read "If he received the letter yesterday, it must have been posted more than a week ago". Again, let a denote the statement "No foreigners are eligible for that appointment, and this man is a foreigner," and let b denote the statement "This man is not eligible for that appointment". Then the symbol $a:b$ may be read "If no foreigners are eligible for that appointment, and this man is a foreigner, he cannot be eligible for that appointment". Here a denotes a compound statement which may be resolved into two factors. Let m denote the first factor, "No foreigners are eligible for that appointment," and let n denote the second factor, "This man is a foreigner"; then $a=mn$, and the symbols $a:b$ and $mn:b$ denote exactly the same statement, namely, "If no foreigners are eligible for that appointment, and this man is a foreigner, he cannot be eligible for that appointment".

Expressions of the form $a:b, mn:b, a+b:c+d$, &c. (involving the symbol :) are called *Implications* or *Conditional Statements.* The statement to the left of the sign : is called the *Antecedent,* and the statement to the right of the sign : is called the *Consequent.*

Def. 4.—The Symbol =, when placed between two statements, asserts that the two statements are equivalent, each implying the other. Thus the equation $a=b$ is equivalent to the compound implication $(a:b)\,(b:a)$; or, as it may be expressed symbolically $(a=b)=(a:b)\,(b:a)$.

It is easy to see that the implication $a:b$ is a brief and convenient equivalent for the equation $a=ab$. The economical advantages secured by adopting the former as an abbreviation for the latter do not seem so great when the antecedent is a simple expression as above. But let the antecedent be a complex expression, and the advantages secured by the symbol : become apparent at once. It requires no formal proof to show, for instance, that the implication $a+bc+de:x$ is a much simpler and more manageable expression than its equivalent, the equation $a+bc+de=(a+bc+de)x$. But mere economy of mechanical labour is not the sole advantage which results from the adoption of this symbol of inference or conditional statement. It is also a very simple and suggestive representation of a great and fundamental law which runs through all reasoning, and

which, from want of a better name, I will call the *Law of Implication.* This law expresses the broad fact that the sole function of the reason is to evolve fresh knowledge from the antecedent knowledge already laid up in the store-house of the memory, and that unless we supply it with this material to work upon, it will not work at all. A mere sense-impression, too fleeting and transitory to enter into combination with some previous recollection, is a material of which the reason can make no use. This law of implication seems to have presided over the very birth and infancy of human speech, as well as over its subsequent growth and development. Every verbal statement, as we all know, may be divided into two distinct parts, which are technically called *subject* and *predicate.* But if we examine very closely the meanings of these terms, we shall find that the relation in which they stand to each other is strikingly analogous to that connecting the terms *antecedent* and *consequent* in any implication $a:b$. Take for example the statement "Man is mortal". Let a denote the statement "He is a man," and let b denote the statement "He is mortal". Then the implication $a:b$ is an exact equivalent for the statement "Man is mortal". But this subject will be considered more fully when we come to speak of the syllogism.

Since the implication $a:b$ is an equivalent for the equation $a = ab$, it follows that the antecedent a is a *multiple* of the consequent b.

Def. 5.—An *accent* (′) is the symbol of *denial*, and simply negatives any statement (simple or complex) to which it is affixed. Thus a' is the *denial* (or negative) of a. It does not assert that a (if a compound statement) may not possibly contain *some* true factors; it only asserts that there is falsehood somewhere, that *one* factor at least of a is false. If a denotes the statement "He will go to Aberdeen," a' will denote the statement "He will *not* go to Aberdeen". So if ab denote the compound statement "He will go to Aberdeen, and she will go to Brighton," then $(ab)'$ will simply deny this, and may be read "*It is not true* that he will go to Aberdeen and that she will go to Brighton".

A little consideration will show that the symbol $(ab)'$ is equivalent to the symbol $a' + b'$. Attaching to the former the same meaning as before, namely, "It is not true that he will go to Aberdeen and that she will go to Brighton," the latter may be read "Either he will not go to Aberdeen or she will not go to Brighton". In like manner we get $(abc)' = a' + b' + c'$, and so on.

As another example take the equivalent symbols $(a + b)'$ and $a'b'$. If a and b respectively denote the same statements as

before, the symbol $(a+b)'$ may be read "*It is not true* that either he will go to Aberdeen or that she will go to Brighton"; and the equivalent symbol $a'b'$ may be read "He will not go to Aberdeen and she will not go to Brighton". Similarly we get $(a+b+c)'=a'b'c'$, and so on.

Def. 6.—Statements represented by letters or any other arbitrary symbols, which we adopt for the convenience of the moment and to which we attach only a *temporary* meaning, are usually statements whose truth or falsehood may be considered an open question, like the statements of witnesses in a court of justice. It is convenient therefore to have an invariable symbol which shall be applicable to any statement whose truth is admitted and unquestioned, and to such a statement only. The conventional symbol used for this purpose is the symbol 1. For a like reason it is convenient to have an invariable symbol to represent any statement whose *falsehood* is admitted and unquestioned. The symbol used for this purpose is 0.

These symbols, 1 and 0, I have borrowed from the mathematical theory of probability, which, I need hardly say, was the suggestive origin of my whole method, as it in all probability was the suggestive origin of the similar yet fundamentally different method of Professor Boole.

The following are a few among many useful and symmetrical formulæ that may be readily deduced as necessary consequences of the preceding definitions:—

(1.) $aa'=0$
(2.) $a+a'=1$
(3.) $(abc\ldots)'=a'+b'+c'+\ldots$
(4.) $(a+b+c+\ldots)'=a'b'c'\ldots$
(5.) $(ab+a'b')'=ab'+a'b.$
(6.) $(a:b)=(b':a')$, and $(a:b)'=(b':a')'.$
(7.) $(a:b):a'+b.$
(8.) $(a=b):ab+a'b'.$
(9.) $(x:abc\ldots)=(x:a)(x:b)(x:c)\ldots$
(10.) $(a+b+c+\ldots:x)=(a:x)(b:x)(c:x)\ldots$

The first of the above formulæ, namely, the formula $aa'=0$, symbolically expresses the law of thought to which logicians have given the name of the *Law of Contradiction*. It asserts that a statement and its denial cannot both be true. By virtue of this formula any compound statement that contains any inconsistent combination like aa' vanishes as an impossibility. For example $abcc'=0$.

The formula $a+a'=1$ is the symbolical expression of the law of thought to which logicians have given the name of the *Law*

of Excluded Middle. By virtue of this formula we have the equation $a = a(b+b')$, whatever the statement b may be.

The formula $(ab+a'b')' = ab'+a'b$ may be proved as follows:

$(ab+a'b')' = (ab)'(a'b')'$, by formula 4,

$= (a'+b')(a+b)$, by formula 3,

$= ab'+a'b$, by actual multiplication, omitting the two impossible or zero terms aa' and bb'.

The formula $(a : b) = (b' : a')$ is the symbolical expression of the logical Principle of "Contraposition". It asserts that the statement "If a is true, b is true," is the exact logical equivalent of the statement "If b is false, a is false". The truth of either of these two conditional statements follows as a necessary consequence of the truth of the other. This principle of Contraposition is a very important one.

The formula $(a : b) : a'+b$ deserves some consideration. Let a denote the statement "He will persist in his extravagance," and let b denote the statement "He will be ruined". Then the implication $a : b$ may be read "If he persists in his extravagance he will be ruined," while the disjunctive statement $a'+b$ may be read "He will either discontinue his extravagance, or he will be ruined". To some readers these two statements may seem logically equivalent, so that they should be connected by $=$, the symbol of equivalence, and not by :, the symbol of inference or implication. We will therefore subject the statements to a closer analysis. If they are really equivalent their denials will also be equivalent. Let us see if this is the case. The denial of $a : b$ is $(a : b)'$, and this denial may be read "He may persist in his extravagance without necessarily being ruined". The denial of $a'+b$ is $(a'+b)'$ or ab' (see formula 4), which may be read "He *will* persist in his extravagance, *and* he will *not* be ruined". Now it is quite evident that the second denial is a much stronger and more positive statement than the first. The first only asserts the *possibility* of the combination ab'; the second asserts the *certainty* of the same combination. The *denials* of the statements $a : b$ and $a'+b$ having thus been proved to be not equivalent, it follows that the statements $a : b$ and $a'+b$ are themselves not equivalent, and that, though $a'+b$ is a necessary consequence of $a : b$, yet $a : b$ is not a necessary consequence of $a'+b$.

It is easy to see that the implications $a : 1$ and $0 : a$ give us no information whatever as to the truth or falsehood of a, but that the equations $a = 1$, and $a = 0$ are the exact equivalents of the implications $1 : a$ and $a : 0$ respectively, and that from the former we infer that a is true, and from the latter that a is false.

Consistency of notation in this algebra of logic requires that the implications $a : 1$ and $0 : a$ should each be equivalent to 1

whether the statement a be true or false. In a strictly analogous manner consistency of notation in the common algebra of mathematics requires that a^0 should be equal to 1 whatever be the value of the number or ratio a. In the one algebra we may thus have the anomalous looking equation $(0 : 0) = 1$, and in the other the anomalous looking equation $0^0 = 1$.

The symbol : for the word *implies* is not quite an equivalent for the symbol $\therefore$ commonly used for the word *therefore*. The difference in meaning between the two symbols may be seen from the equation $(a \therefore b) = a(a : b)$. The statement $a \therefore b$ is stronger than the conditional statement $a : b$ and implies the latter. The former asserts that b is true *because* a is true; the latter asserts that b is true *provided* a be true.

We will now examine the syllogisms of Aristotle in the light of this notation. The first thing that strikes anyone on reading these syllogisms for the first time is the constant recurrence of the words *all*, *some*, and *no*, as in the syllogism "*No* men are gods; *all* men are living beings; therefore *some* living beings are not gods" (Felapton). Moreover, in applying these syllogistic rules to examples of ordinary reasoning, expressed in the simple untechnical language of daily life, logicians usually subject this language to more or less distortion, resulting sometimes in extremely uncouth and scarcely comprehensible phrases, in order to introduce one or more of these quantitative words, without the express use of which they apparently think that no argument can be strictly and rigorously logical. For myself, so far am I from regarding those words as indispensable accessories to logic that I look upon them rather as the fatal cords that have for centuries held prisoner this noblest of the sciences and effectually prevented its flight beyond the limits of a meagre and barren circle of insipid truisms. By cutting these cords asunder we can, I believe, set logic free to soar on vigorous pinions into new and fruitful regions, where it will join the other sciences, and in the common pursuit of truth exercise over them all that sovereign authority which is its undoubted right, and which its Grecian fetters alone have hitherto prevented it from exercising. The precise mode in which I think this desirable result may be brought about will become apparent as I proceed.

It has already been pointed out that, by the principle of Contraposition, the implication $a : b$ is equivalent to the implication $b' : a'$. By changing b into b', and therefore b' into b, these give us two other implications $a : b'$ and $b : a'$, which are also equivalent to each other. And when two implications are equivalent their *denials* are also equivalent. Thus $(a : b)'$ is equivalent to $(b' : a')'$, and $(a : b')'$ is equivalent to $(b : a')'$.

These denials of implications I have in my second paper in

the *Proceedings of the Mathematical Society* called *non-implications;* and instead of the accent to express negation I have used as the denial of : the symbol $\div$. Thus $(a : b)'$ and $a \div b$ are symbols which have exactly the same meaning, each asserting that the statement a does *not* imply the statement b, or, in other words, that a may possibly be true without b being so. I shall use the latter symbol in the rest of this paper.

All possible valid syllogisms, including the 19 syllogisms usually given and many others besides, come either directly or by the substitution of equivalents under one or other of the following four standard-implications, which are however more general than the syllogisms, since they are not like the latter restricted to mere classification :—

$$(a : b)(b : c) : (a : c) \quad . \quad . \quad . \quad . \quad (1)$$
$$(a : b)(b : c) : (a \div c') \quad . \quad . \quad . \quad (2)\,[1]$$
$$(a : b)(a \div c) : (b \div c) \quad . \quad . \quad . \quad (3)$$
$$(a : b)(a : c) : (b \div c') \quad . \quad . \quad . \quad (4)\,[1]$$

This is shown in my second paper in the *Proceedings of the Math. Society*, to which the reader is referred for a full and formal proof. I shall content myself here with giving one or two illustrations of the way in which syllogisms may be thus converted into implications.

Take the syllogism called Barbara, "All Y is Z, and all X is Y; therefore all X is Z".

Now by the first premiss, "All Y is Z," is meant that every single individual that possesses the attribute Y (or belongs to the class Y) possesses also the attribute Z (or belongs to the class Z); and the other premiss and the conclusion may be similarly interpreted. No matter who or what any individual may be, we are told in the first premiss that if it possesses the attribute Y, it also possesses the attribute Z. In other words, speaking throughout of some originally [2] unclassed individual, we are told that the statement "It possesses the attribute Y" implies the state-

[1] The statement a is here understood to be a *consistent* statement, *i.e.*, a statement which *may* be true. When this restriction is removed the second of the above implications should be written

$$(a : b)(b : c) : (a \div c') + (a : 0),$$

and the fourth should be written

$$(a : b)(a : c) : (b \div c') + (a : 0).$$

This note has been suggested by some friendly criticism of my logical system with which the Rev. J. Venn has kindly favoured me.

[2] The mathematical reader will notice the analogy between this representation of a whole class by a single individual possessing the distinguishing attribute of the class and the representation in analytical geometry of a whole series of points or locus by a single specimen-point belonging to this locus.

ment "It possesses the attribute Z"; so that if y denotes the first statement and z the second, we have the implication $y : z$, which may be read "If any individual possesses the attribute Y, it must also possess the attribute Z". In like manner "All X is Y" may be expressed by the implication $x : y$, and "All X is Z" by the implication $x : z$. Speaking throughout therefore of some originally unclassed individual, the syllogism becomes

$$(y : z)(x : y) : (x : z).$$

If we change the order of the premisses, this becomes

$$(x : y)(y : z) : (x : z),$$

which may be read "If any individual possesses the attribute X, it must also possess the attribute Y, and if it possesses the attribute Y, it must also possess the attribute Z. Consequently, if it possesses the attribute X, it must also possess the attribute Z." In this form the syllogism is an example of the first of the four standard-implications given above, for we only substitute x for a, y for b, and z for c.

Take next the syllogism called Fresison, "No Z is Y, and some Y is X; therefore some X is not Z".

As before let x, y, z respectively denote the three statements that a certain individual belongs to the class X, that it belongs to the class Y, and that it belongs to the class Z. Then "No Z is Y" is equivalent to the implication $z : y'$, which may be read "The statement that an individual belongs to the class Z implies that it does *not* belong to the class Y". The second premiss "Some Y is X" is equivalent to the *non-implication* $y \div x'$ or $(y : x')'$, which may be read "The statement that any individual belongs to the class Y does not imply that it is excluded from the class X". From these two premisses, on the understanding that the same individual is spoken of throughout, follows the conclusion expressed by the implication $x \div z$ or $(x : z)'$, which may be read "The statement that an individual belongs to the class X does not imply that it belongs to the class Z". The symbolical expression of this syllogism is therefore

$$(z : y')(y \div x') : (x \div z).$$

This may be brought under the third of the four standard-implications given above as follows. By the principle of Contraposition (or transposition) we get $(z : y') = (y : z')$. Substituting and reading y for a, z' for b, and x' for c in the third standard-implication we get

$$(y : z')(y \div x') : (z' \div x') ;$$

and the conclusion $z' \div x'$, by the principle of Contraposition, is equivalent to $x \div z$.

It is needless to give any more examples. The method of

conversion is the same throughout. Each premiss of a syllogism is expressed as a simple implication or non-implication, and the whole syllogism thus becomes a complex implication. The principle of logical Contraposition, which bears a remarkable analogy to the rule of "transposition" in algebraical equations, is appealed to frequently. By this principle we may transpose the antecedent and consequent of any implication, provided we at the same time *change the sign* of each. By "changing the sign" of a statement I mean affixing or removing the accent of negation. Thus, by Contraposition, the implication $x : y'$ is equivalent to the implication $y : x'$; and the non-implication $x \div y'$ to the non-implication $y \div x'$. In both cases of equivalence the unaccented x moves from the left to the right and *assumes an accent*, while the accented y moves from the right to the left and *drops its accent.*

No part of logic has received so much attention and given rise to so much discussion as the syllogisms of Aristotle. This is why I have selected them as illustrations of the application of my symbolical method. A far more important subject of application however is the great and ever recurring problem of physical science—how to discover the general laws which regulate the various phenomena of the material universe. How logical symbolism may be systematically and advantageously employed even in those difficult researches and in cases quite beyond the reach of the ordinary mathematical symbolism has been briefly indicated in my third paper, published in the *Proceedings of the Mathematical Society.*

The reader will observe that the whole of my symbolical system of logic rests upon very simple and easily grasped principles. Though this system does not necessarily exclude metaphysical considerations, it is both theoretically and practically independent of such considerations, and rests upon a surer and firmer basis because it is thus independent. It may be a branch and a very important branch of *applied* logic to investigate the primary source and origin of the knowledge which we find existing in our mind, but it certainly is no part of *pure* logic. *Pure* logic must take this knowledge for granted. We must reason from the known to the unknown whatever be the subject of investigation, and it is the proper and special function of pure logic to explain how this may be done most safely and most certainly. If teaches us (if I may be allowed the metaphor) how to use our intellectual oars and steer the boat of reason whatever be the direction in which we wish to travel, and without troubling ourselves as to the exact source of the river on which that boat is moving. A short distance up this river we may be able to go, in spite of the strong opposing current,

and we may even succeed in tracing to its source a little tributary here and another there; but up the river or down the river the motion of the oars is always the same, and it is by the help of the water within their sweep that the boat is ever propelled onwards into new positions. It is through and by means of the knowledge expressed by the *antecedent* that the reason reaches the knowledge expressed by the *consequent*. The latter becomes a means and medium of progression in its turn, and so the reason moves onward from knowledge to knowledge.

Just as my symbolical method, though not necessarily excluding metaphysical considerations, is yet independent of such considerations, so, though it does not necessarily exclude inquiries into grammatical distinctions, it is yet independent of all such distinctions. Grammar, like metaphysics, may be an important branch—indeed it *is* an important branch—of *applied* logic, but, like metaphysics and many other special subjects of investigation, it is no essential part of *pure* logic. The student of pure logic need know nothing of grammar, absolutely nothing. The grammatical structures of sentences are matters with which he has no special concern. His business is to investigate the logical relations in which *statements* stand to each other, and if he understands the exact meaning of each statement that enters into his argument, he need not trouble himself as to the exact form of words in which that statement is expressed. Nay more; the statements of his argument need not be expressed in words at all. If he understands their meaning singly and collectively, it is enough. Any sign or symbol that conveys any intelligible information to the mind may be regarded as a *statement* so far as the logician is concerned with it. The deaf and dumb make use of many signs among themselves (apart from their regular alphabet) which in this sense are real statements, and if sufficiently numerous might answer all the purposes of ordinary speech in any logical argument; and yet these are statements which cannot easily be resolved into *subject* and *predicate*. Much has been written in praise of, and a good deal has been written in disparagement of, Hamilton's logical scheme called the "Quantification of the Predicate". Prof. Jevons, in his *Elementary Lessons in Logic*, speaks of the scheme in terms of high approval. Mr. Ellis, on the other hand, in the *Educational Times* for August, 1872, calls it "an unfortunate conception" and "a barbarous abuse of language". My system, which adopts full and complete *statements* as the ultimate constituents into which any argument can be resolved, steers clear of the discussion altogether. At the same time, though it does not recognise the question as in any way an essential one, or one properly belonging to pure logic at all, it is

not on that account debarred from discussing it if it so chooses. It certainly is worth remarking as a matter of some interest, though not as a matter of paramount importance, that Hamilton's "All X is all Y" is expressed by the equation $x = y$, which is equivalent to the compound statement $(x : y)(y : x)$; that his "All X is some Y" is expressed by the compound statement $(x : y)(y \div x)$; that his "Some X is some Y" is expressed by the compound statement $(x \div y)(x \div y')$; and that all his other "quantifications" may be similarly translated into the language of my calculus. In this translation the letters x, y, y' are to be understood in the sense which I attached to them when discussing the syllogism; that is to say, they all denote *classifying statements*, referring to some one originally unclassed individual as their common subject.

I think I have now sufficiently explained the fundamental principles on which my Symbolical System of Logic is construeted, though not the rules of symbolical operations which are founded upon these principles, nor yet the various practical applications of which the method is capable. A full and detailed account of these, such as I have given in the *Proceedings of the Mathematical Society*, would be altogether beyond the aim of the present paper. In explaining what I believe to be the advantages of my own system, I have carefully avoided drawing any comparison between it and other systems which are already before the public. With two of these, Prof. Boole's and Prof. Jevons's, it has much in common, but it has been conceived and developed quite independently of theirs, and the points of difference which distinguish it are fundamental and important.

HUGH MCCOLL.

IV.—THE PHILOSOPHY OF REFLECTION.

THE two volumes by Mr. Shadworth Hodgson, under the title of *The Philosophy of Reflection* (Longmans, 1878), complete for him a cycle of thought, whose earlier stages were marked by the issue of *Time and Space* in 1865, and *The Theory of Practice* in 1870. The present work constitutes a system of which the former ones contained the grounds and preparations. It goes over some of the same subjects as they did, corresponding to a greater extent with *Time and Space* than with *The Theory of Practice*, and adds some new matter, especially suggestions toward a Constructive Branch of Philosophy. In endeavouring to estimate the author's position as a philosopher, it will be best to

deal chiefly with the latest and systematic work, referring occasionally to the others (which have been longer before the world) for illustrations and details.

The results of many years' devotion to philosophy, with eminent ability and ample learning, require no terms of general commendation. Let us proceed at once to the examination of one of the most serious speculative efforts of the present generation.

Probably Mr. Hodgson intends that his system should be known as the Philosophy of Reflection just as Kant's is known as the Critical Philosophy, and Reid's as the Philosophy of Common Sense. The characteristic of his doctrine, he says, in relation to the History of Philosophy, is the principle of Reflection (p. 8). Let us then begin by inquiring what is meant by Reflection, what is its principle and its method. Reflection we read (p. 6) is "the moment of distinguishing the objective and subjective aspects of phenomena". Every phenomenon, as I understand, has two aspects, an objective and a subjective; objectively it is a thing or entity, subjectively a state of consciousness or feeling, or group of feelings. The principle of Reflection is that these aspects of phenomena, though distinguishable, are inseparable; and to become aware of their inseparability as a general truth, to bear it constantly in mind is "to elevate the act or process of Reflection into a method" (p. 57). Or, again, "A thing *is* what it is *known as*, this is the principle in its objective formula; the objective and subjective aspects are inseparable, this is its subjective formula" (p. 149). In employing the method of Reflection, "we continually ask what we mean by such and such terms, what is the analysis of such and such percepts" (p. 57): for instance, what do we mean by Number, Motion, Cause, Force, Matter, &c. (p. 44).

To many readers this may appear an excellent foundation for a system of metaphysic. It certainly seemed so to me; but since in other writers similar expressions have raised hopes that have not been fulfilled, we must inquire more closely into the meaning of the principle of Reflection. What is intended by the objective and subjective aspects of a phenomenon? "Aspect, as a philosophical term, means a character coextensive with and peculiar to the thing of which it is an aspect." "In philosophy there is one ultimate pair of aspects which are universal and necessary, Subject and Object". (II., p. 20). "*Phenomena* is a term for the union of these two aspects, being a word which expresses both, *things* that *appear*" (p. 22). Since then these aspects are universal, and since the word phenomenon means the union of them, it is plain that in Mr. Hodgson's view every phenomenon has both an objective and a subjective aspect.

Tooth-ache, for example, is a phenomenon, and must have both aspects; it is not merely that a subjective ache is related to an objective tooth, but the ache itself is both subjective and objective; objective when you view it as a thing felt, subjective when you reflect that it is a feeling. "States of consciousness," says the author (*Time and Space*, p. 7), "when reflected on, are as objective as external phenomena." To speak of a pleasure or pain as objective or as a thing felt sounds a little harsh; and it is already plain that the terms subjective and objective have not, in Mr. Hodgson's vocabulary, the same meaning as in the writings of (say) Mr. Spencer or Prof. Bain. In their view these words signify two orders of feelings or states of consciousness which are distinguished as orders by certain characteristics; and if their lists of these characteristics do not coincide, neither do they conflict. But, says Mr. Hodgson, "in my view . . . the philosophical as opposed to the psychological view, feeling, so far from being the common genus of the objective and subjective aspects, is a name for the subjective aspect alone, and its obverse, the objective, aspect is existence." From which it seems fair to infer that a tooth-ache viewed objectively is not a feeling, and viewed subjectively is non-existent. We shall hereafter meet with many of Mr. Hodgson's doctrines which cannot be understood without extreme care in seizing the peculiar sense in which he uses some of the commonest philosophical expressions.

With the fundamental principle of Reflection another important doctrine of Mr. Hodgson's philosophy is closely connected, namely, the distinction between *nature* and *history*, whereby Philosophy is divided from Science. Those who understand by object and subject two contrasted orders of feelings frequently regard them as conditions of one another. For instance, subjective representations of tables formerly observed are a condition of fully cognising the present objective table. But in Mr. Hodgson's view it is one of the most serious mistakes that can possibly be made to regard the aspects of a phenomenon as its conditions, or as conditions of one another (II., p. 5). The conditions of a phenomenon are whatever stand to it in some definite time and space-relations, and this can never be said of its aspects which, though distinguishable, are both of them the identical thing. Again, of this present phenomenon, the table, object and subject, if we mean vivid and faint feelings, may be said to be elements, since it is constituted by the coalescence of present vivid sensations with the representations of former similar sensations in similar relations. But Mr. Hodgson distinguishes the aspects from the elements of a phenomenon thus: The objective and subjective aspects of a phenomenon being

identical, its elements must be the elements of its subjective aspect, and these are (1) the material element, feeling, and (2) the formal elements, time (since every feeling has duration), and space if the feeling is tactual or visual. Now, the aspects and elements of a phenomenon constitute its nature; its conditions are its history: and whilst an inquiry into its nature is Philosophy, an inquiry into its history is Science. Moreover, inasmuch as to inquire into the nature of a thing is to analyse it, it is the distinction of Philosophy to be analytic. "The nature, analysis, or whatness of any thing is double, subjective and objective. This belongs to reflection and to philosophy. The genesis or history of any thing is not double, but of two separate kinds; there is the history of the thing itself and the history of our knowledge of the thing" (I., p. 71). The former is the science of material things, the latter is Psychology.

I do not think Mr. Hodgson means to deny to chemists the rights of analysing compounds without being accused of metaphysics; for it is another distinction of philosophy to be subjective (p. 75). But it seems that psychologists must not analyse, or at least not indulge in ultimate analysis, since to be ultimate is another philosophical distinction (p. 75); and perhaps not analyse states of consciousness at all, "unless in reference to their conditions in the organism" (p. 54).

Both these doctrines, the principle of Reflection and the distinction between Nature and History, are very important, though we may not agree with the way in which Mr. Hodgson states them, nor always with the way in which he applies them. The principle of Reflection, expressed as the mutual dependence or implication of the objective and subjective orders of feelings, is a most commanding position for metaphysical criticism. And *Reflection* is a good name for it; for if not directly very expressive, it at least need not occasion misunderstandings, as *Idealism* does, so that well-instructed writers may still be found arguing as if Idealists supposed that phenomena were unreal, though that was never a tenet of the best modern empirical Idealists. Reflection, then, gives an actual analysis of the world, or, in other words, reveals its nature. But no sooner is this displayed than it is confronted with the history of the world as elucidated by the physical sciences, according to which subjective phenomena are a comparatively recent addition to it. This antagonism is the most serious in the whole range of speculation. Some such terms as Reflectional and Cosmological would, I think, designate the conflicting views better than Nature and History.

Upon the strength of this distinction Mr. Hodgson describes himself as an "Idealist (or rather Reflectionist) in Philosophy;

Materialist in Psychology, and indeed in all the sciences. "The causes and the genesis of this and that individual conscious being, as well as of each and all the states and processes of his consciousness, depend upon matter in motion" (p. 226). To explain the origin of matter is a problem which he refers to the constructive branch of Philosophy, which remains to be constituted; and meanwhile he does not, that I can discover, draw any distinction with respect to certainty between the conflicting views. Coherent thinking, however, must, I think, force us to admit that the principle of Reflection is an unmistakable fact, and the cosmological doctrine merely a hypothetical representation or ideal construction.

For Mr. Hodgson's doctrine that analysis is the method of Metaphysics, and not of Psychology, there is much less to be said. Psychology cannot get on without analysis, which is often, perhaps usually, preliminary to an inquiry into conditions; nor can Metaphysics dispense with the help of an inquiry into conditions, which in its turn is often a great aid to analysis. To attempt to separate these processes is to refuse to recognise any but direct analysis by simple inspection; but a thorough direct analysis may be impossible, whereas an indirect analysis by means of a synthesis of hypothetical conditions may suggest what we should look for and bring to light elements before unseen. Of this Mr. Hodgson himself supplies a good example, no other than the mode in which he analyses, or at least expounds the analysis of, the moment of Reflection.

We know what it is, he says (I., p. 108) to find ourselves having feelings and thoughts and in the presence of objects. "This total state of mind clearly contains the object to be analysed, the moment of self-consciousness itself," or reflection. And we may distinguish in the total state "three things, the person having the feelings and thoughts; the objects around him; and the feelings and thoughts themselves. Now, it is a well-attested fact of observation that infants have feelings and thoughts without having the perception of *themselves* as persons." I wish Mr. Hodgson had remembered just here what he often insists upon, the difference between inference and observation, and had called this "fact," instead of "a well-attested observation," an inference impossible to verify; for only infants can have observed it, and their attestations are still wanting. However, if it is a fact, the three things mentioned above, persons, objects, and feelings, are reduced to two, and there may be a state of consciousness comprising only feelings and objects. But further, Mr. Hodgson infers from the circumstances of low organisms and other data, that consciousness originally comprised only one thing, namely, feelings—feelings which had no

reference either to persons or to things. This state he calls "primary consciousness"; and having thus discovered the antecedents or conditions of the moment of reflection, returns to it by synthesis thus: "In some way or other the perception of independent objects, and the perception of a percipient subject supervene upon, or are developed out of, these primary states. There is no other alternative. For since neither objects nor self are given alone, *per se*, and also are not given along with the primary states originally,—there must be a time or 'moment' of change, in which primary states of consciousness receive a modification and pass into states either of self-consciousness, or of consciousness of objects, or states which are both together." "The first and simplest reflection which arises in the primary consciousness of an infant," then, is this: "These thoughts and feelings are not only thoughts and feelings, but bundles of constantly connected thoughts and feelings, that is, 'things'; . . . without ceasing to be *states of consciousness:* . . . that which was undistinguished has, I now see, a distinction into consciousness and object of consciousness." Here Mr. Hodgson's point seems to be, that at some period a change takes place in primary consciousness, such that feelings and thoughts are perceived to be also things; though so much, I think, was never recognised of all feelings and thoughts. This is the moment of Reflection: and after this, consciousness reaches another stage, at which feelings and thoughts on the one hand and objects on the other, though really inseparable, are regarded as separate and independent entities; so that now feelings and thoughts are referred to an immaterial substance, and objects to an external world (p. 115). This third stage Mr. Hodgson calls "direct consciousness". It is, he says, the mental attitude of men generally, of science as contrasted with philosophy, and of bad philosophy as contrasted with the philosophy of Reflection.

Upon these passages I observe, in the first place, that they contain a clear case of an analysis assisted by an inquiry into conditions. And, secondly, I must confess myself unconvinced that primary, reflective, direct, is, as Mr. Hodgson maintains, the necessary order in which these stages of consciousness succeed one another. He says that we must take primary consciousness as prior in order to "avoid any unfounded assumption". But one would have supposed that the only way of avoiding unfounded assumptions was to begin with the principle of Reflection,—the mutual dependence of the objective and subjective orders of feelings. Starting from this fact, now ascertained, we may try to imagine the modes of consciousness which preceded its determination: we may suppose the priority of "primary consciousness," as a psychological hypothesis from

the cosmological or historical point of view; we may suppose the gradual differentiation of the objective and subjective orders of feelings out of that comparatively homogeneous flux ages before conscious reflection supervened; we may trace the formation of direct consciousness, and perhaps explain the rise of ontological systems; until, as the late result of Psychological analysis, the principle of Reflection, that rock of our present sure foundation, is discovered, and a footing secured upon it for sound Metaphysics.

With the insight now won into some of Mr. Hodgson's fundamental principles, we are prepared to consider his solutions of particular problems. Let us begin with Existence; which seems to have a reasonable priority, because it is "a notion not peculiar to any one science, but common to all, and involved in the particular ultimate notions of each". What, then, do we mean by Existence? "In general terms it may be said that, for philosophy, existence means presence in consciousness, *esse* means *percipi*; and this quite generally, so as to include all the modals into which the general proposition may be thrown; as, for instance, possible existence designates what is possibly present in consciousness; &c." (I., p. 49). This looks very sound: but then feelings must be present in consciousness, and a passage from Vol. II. has already been quoted in which Mr. Hodgson says, that "feeling is a name for the subjective aspect alone, and its obverse, the objective aspect, is existence:" and, adding this passage to the last, it might be supposed that feelings were not present in consciousness. Moreover, the last passage continues thus (I., p. 50): "For all modes of existence there are corresponding modes of presence in consciousness". Here modes of existence seem to be not identical but only correspondent with modes of presence in consciousness; which at first suggests some such ontological realism as Mr. Hodgson abhors, but seems to become a contradiction when we remember that existence has just been defined to mean presence in consciousness.

These difficulties would not, I believe, have arisen if Mr. Hodgson had taken subject and object to be the two contrasted orders of feelings or phenomena, instead of two aspects of every phenomenon. He might then have defined existence to be whatever enters into a relation of object and subject. And in fact this seems to be his real meaning; for he says (II., p. 48), "The subjective aspects of material objects exist as well as the objects themselves; and states of consciousness such as are the emotions and feelings of pleasure and pain, which have no material objects, yet exist for the subjects of them. Subjective states and objective things, then, are both alike existents" (*cf.*, p. 112). And at p. 76 he says, that states of consciousness

are existents, though "of a peculiar kind," that is, "not solids in motion". So that since this is clearly the best meaning of existence, and an author has perhaps a right to have his best meaning selected as the only true and genuine one, let us agree that in the Philosophy of Reflection existence and consciousness are coextensive. There is one world of phenomena which psychology calls consciousness, and the physical sciences existence; whilst the business of metaphysics is to explain to people that it is all the same, when they seem to be in danger of talking nonsense by forgetting it.

Next let us take the problem of Things-by-themselves. Mr. Hodgson says (I., p. 219): "The main problems of the analytical branch of philosophy—that is, of metaphysic, are, I conceive, two. The first is that of Things-in-themselves." And his way of disposing of Things-by-themselves is very short, but very effective. He shows that the notion of such entities necessarily springs from the exercise of direct consciousness. This attitude of mind involves the assumption at the outset of all investigations that something exists independent of consciousness. The mind, itself a thing apart, is assumed to come to things also apart, and makes inquiries about them: if its inquiries are not completely satisfied, if there remains an unexplained residuum in things, this residuum is called "unknowable existence," or the Thing-by-itself apart from consciousness and from the phenomena present in consciousness. Such is the consequence of relying on the direct attitude of mind. But when falling into the reflective attitude we inquire what after all we mean by existence, the Thing-by-itself, this substance or shadow which shape has none, ceases to haunt us: for we find that existence means presence in consciousness; so that there can be nothing apart from consciousness or from phenomena, no Thing-by-itself; and "unknowable existence" becomes a contradiction in terms (I., pp. 162 ff.).

Here we have certainly a short and easy method with Things-by-themselves: contrasting favourably in point of brevity and facility with the longwinded and sometimes obscure argumentation on the subject to which metaphysicians have hitherto commonly treated us. But when we ask what gives its efficacy to such a ready process, we see that Things-by-themselves are abolished by appealing to the definition of Existence and the principle of Reflection. This definition and this principle are, however, themselves results of the long and difficult arguments and analyses of former metaphysicians—arguments and analyses for which these volumes hardly contain an adequate substitute.

Still (some phrases apart) the result seems to be sound; some

of the stages of the argument by which it may be supported are well stated and illustrated by Mr. Hodgson; and I particularly admire the boldness with which he has applied it to the Ego or mind, as well as to material substance. Having at p. 163 dismissed the subjective noumenon both as substance and as agent, he supposes himself at p. 225 to be asked: "Where do you look for the cause, the substance, the agent, the conscious thing (call it what you will), of consciousness?" and he answers by taking the distinction between Nature and History. As to Nature, he says, "The nominal definition I would give of the soul or mind is—*a series of conscious states among which is the state of self-consciousness.*" As to History, "The agent or substance which becomes conscious, or in which resides the force of becoming so, or which *has* the states of consciousness, is not the series or any one or more of the states which compose it, but (in man) the brain or nerve substance." "The first *cause* that we can discover anywhere is matter in motion," and the origin of matter is a problem for the Constructive Branch of Philosophy. The prior condition of consciousness at large Mr. Hodgson does not profess to assign. Plainly such a topic could have no place in any coherent Philosophy of Reflection.

The question, however, arises, what is that "state of self-consciousness" whose presence amidst a series of conscious states completes what is called a soul or Ego? It is, of course, not what is popularly called self-consciousness—the state of mind so natural and engaging in a Senior Wrangler or a *débutante*. At p. 50 we read, "We know existence as consciousness, and to know that we do so is self-consciousness". Now, to know existence as consciousness is to know it as feeling: self-consciousness, then, is the consciousness that feeling is coextensive with existence; and self must be the sum of feelings, or the subjective aspect of phenomena in general. And somewhere, I believe, in the *Philosophy of Reflection* this is more clearly stated, but I cannot recover the passage. On turning, however, to *Time and Space*, p. 220, we read: "The Empirical Ego is the complex of all feelings or states of consciousness, as distinguished by Reflection from the qualities which are their objective aspect"; whilst the Pure Ego is "a continuous feeling or consciousness," which appears as abstract and general feeling—not, like the Empirical Ego, a series of determinate states (pp. 181-2).

From all this it is manifest that Mr. Hodgson has rid himself of the notion that the Ego is a mysterious something apart from phenomena. Will, he says, like force, on analysis vanishes as an entity: it is an expression for *action* in conscious beings (II., p. 283). I cannot maintain that his language is always

easily reconcilable with this view: but that is partly, at least, because common forms of speech, being suited to the expression of direct consciousness, involve the assumption that self is a substance and cause. It would be a great service to metaphysics if some thinker would set himself to frame a variety of expressions which might be substituted for those of popular language, where the latter involve this and similar assumptions which must be rejected by Reflective Consciousness.

On the other hand, I cannot think that Mr. Hodgson has done well in making the Ego or Self coextensive with existence. This was indeed the natural result of the position that every phenomenon has a subjective aspect. But those writers appear to me to hold a simpler position who, regarding object and subject as contrasted orders of phenomena, have it open to them to identify the Ego with the subjective order. And I cannot help asking Mr. Hodgson whether, if the Mind or Ego is a series which contains the state of self-consciousness, there is no Mind, Soul, Self, or Ego in primary consciousness whilst the moment of reflection has not yet occurred.

The second problem of the analytic branch of philosophy "is identical in purpose with that which Kant proposed to himself, and which he formulated by the question, 'How are synthetic *à priori* judgments possible?' . . . The problem may be designated as that concerning the strict and inviolable necessity of the Law of the Uniformity of Nature; of the principle of *Ratio Sufficiens*; or of the Law of Causality; to find, if possible, a metaphysical basis for the Sciences, &c." (I., p. 220). Mr. Hodgson undertakes to demonstrate such a principle from the postulates of Logic taken in conjunction with the phenomenon of Reflection; and he leads up to the demonstration by an elaborate analysis and criticism of the cognitive process of consciousness. Leaving these preparatory topics, which do not seem essential to the intelligibility of the result, we will pass at once to the author's solution of the problem of the inviolability of Nature's uniformity. It occupies the greater part of two chapters towards the middle of Vol. II.

Mr. Hodgson contends that, in the first place, it follows from his former position concerning Existence and Things-by-themselves, that the Postulates of Logic, *i.e.*, the Principles of Identity, Contradiction, and Excluded Middle, apply to the whole of existence, as existence is understood in the Philosophy of Reflection, to the whole of existence, and to every part of it, however vague or however minute. He then proceeds to prove that the Postulates of Logic carry with them and involve the Axiom of Uniformity, so as to compel us to regard it as of equal validity with themselves. The three Postulates, hang together,

are aspects of each other, expressing one and the same fact; but since the Axiom of Uniformity is a positive statement, it can only be compared with the positive postulate, that of Identity. It has to be shown, therefore, that the Postulate of Identity involves the Axiom of the Uniformity of Nature.

A is A: let this be granted, and it is impossible to deny that A always has been A, and always will be A. In the Postulate of Identity the copula must be considered as free from all restrictions of tense, so that the statement is perfectly general. A is A, no matter where or when. And thus interpreted, I understand Mr. Hodgson to maintain that the Postulate is identical with the Axiom of Nature's uniformity, because were it possible that A should not be A, Nature would not be uniform.

There are indeed, Mr. Hodgson admits, two ways of regarding the Axiom: first, as stating that Nature is uniform; secondly, as stating that the *course* of Nature is uniform; but these are respectively only the static and dynamic aspects of the same truth; and both flow equally from, or rather are "the phenomenal aspects of the postulates". They correspond with two ways of looking at the nexus of events in Time, namely, either transversely, as if events were a panorama of figures in adamant which knew neither origin, change, nor dissolution, fixed and coexistent in an eternal Now; or else, longitudinally, as a stream or insubstantial flux of things, or as transformations in the ethereal body of a cloud, appearing and disappearing between the past and hereafter. Viewing Nature in the former way, we are to speak of the axiom of its uniformity; viewing it in the latter way, to speak of the axiom of the uniformity of the *course* of nature is more appropriate.

Another "difference of the two axioms is that the one envisages single percepts, the other envisages sequences of percepts". The first states, that every A is A; the second, "that whenever A is found it will be followed or accompanied by the same thing B, as it was the first time". Though this last phrase is, if I understand Mr. Hodgson, a slip; since it is not necessary, I suppose, that A should ever occur twice; and he rather means that *whenever A is found it is followed or accompanied by a certain B, without which, in fact, it would not be A.* "For," he goes on, "if A were followed by B yesterday, and by not-B to-day, there would have been some relation in which A stands now, which it did not stand in before; that is, A would not have been strictly *the same* A in the two cases (II., p. 108).

Such is Mr Hodgson's demonstration of the axiom of Uniformity from the postulate of Identity. It has plainly been obtained by regarding the axiom as an identical proposition.

That such would be the result every reader who has already threaded many a similar labyrinth, must from the outset have undoubtingly foretold. Mr. Hodgson ought to state the principle of causality somewhat in this way: Every cause, determined in relation to a given effect, always has that effect. And this is not unlike the familiar argument, that every effect must have a cause, since otherwise it would not be an effect. Whereas when we say that the same cause has uniformly the same effect, or that the same event occurring in the same circumstances has always the same consequence, we of course mean, if we mean anything, that the cause or antecedent event is to be thought of as the same in itself and in its circumstances apart from its effect or consequence. This is what those who try to think accurately usually mean to say[1]; but it may perhaps be questioned whether such a meaning does not necessarily involve inaccuracy of thought.

A is A; A is followed by B: but what is A? A is never isolated. Can we know A apart from B; or think of A without a latent reference to B? Can A even exist except in relation to B?

As to the former question, whether we can know or think of A except with reference to B,—either we can do so, or else we cannot think of A at all. For, first, if we cannot know A apart from B, we cannot know A until B has arisen, and then A has already disappeared. And, again, unless we can know A apart from B, neither can we know B apart from C, nor C apart from D: from which it follows that we cannot know A except as A, B, C, D, &c.; that is, in relation to the whole of existence. And thus the harmless-looking proposition, A is A, turns out to mean that A in relation to the universe is A in relation to the universe; and the principle of Identity, the so-called first law of thought, becomes quite unthinkable. The truth seems to me to be, that Identity is an affair of definition. There is no principle of Identity, because we need a convention as to the meaning of the word. Mr. Hodgson, for instance, thinks that similarity and sameness are to be explained by reference to identity (II., p. 145), whilst he admits that identity is never empirically determinable; that is, he would explain the known by the unknown. On the other hand, it might be suggested that identity is to be explained by reference to similarity, and means a certain complex sameness.

Now, in the Philosophy of Reflection things are what we mean by them, or what consciousness faithfully consulted reveals them to be. This applies to knowledge as well as to anything

[1] Except, perhaps, Hobbes: *cf. De Corpore*, Part II., c. 9.

else. Knowledge is what we mean by knowledge; and we do not mean omniscience. Therefore a knowledge of A does not mean of A in relation to the universe, and therefore not necessarily in relation to any particular B. Knowledge is always partial; and although a partial knowledge of A requires, according to the law of relativity, a knowledge of some not-A, still this is also a partial knowledge, and needs not include B.

A similar solution applies to the question whether A can *exist* except in relation to its consequent B. As a matter of fact A does exist before B, and therefore apart from it; and when B comes into existence A vanishes, and is swallowed up in B. That is what we mean by causation. If Mr. Hodgson urges that this may be so, viewing time longitudinally as a flux; but that, viewing time transversely, A and B may really coexist in the eternal Now, and only seem to be successive from our incapacity to experience them otherwise,—one must reply that such a speculation as this about statical time has no place in the Philosophy of Reflection. What do we mean by time? It is certainly hard, nay, impossible to say. Of that mature sense of time which is at once as clear as an intuition and as massive as an emotion, it is indeed possible to give an analysis and description. But of the time-element, so to speak, of which the sense of time is a clarified accretion, no account can be given: it is an ultimate experience, the most ancient and simple of all that we know. This, however, one may say, namely, that time is not space, but in every way contrasted with space. Yet it is difficult to help suspecting that the curious speculation about statical time entirely arises from a confusion of time with space; a confusion greatly favoured, and made almost unavoidable except to the most resolute clearheadness, by our common modes of measuring time by means of space and motion; by the entanglement of space and time in their psychical genesis; and by the fact that with time, as with other things, when we try to think of it we try to look at it, and we can see anything only as in space. Hence we often speak of time as having one dimension, and perhaps think of events in the past as still existing at the further end of a tunnel with darkness between. Mr. Hodgson distinguishes between the thread of time and the various concepts or percepts through which it runs; he speaks of "the time-thread always going on whatever may be the content"; he says "a percept is a portion of time filled with consciousness"; he suggests that time may have a second dimension, as well as space a fourth; he asserts, "there is no *absolute* first and last in time, just as there is no *absolute* up and down in space". But dimension is a word to analyse space with, and is only metaphorically used of time:

time, strictly speaking, has no dimension; no existence but in changes of consciousness which are nowhere; and these changes have an actual succession, which is absolutely irreversible. To avoid the influence of misleading representations which can hardly be dispensed with, let us cancel one with another, and sometimes imagine time, not as a thread or stream, but as a twinkling iridescence in a plane, perpendicular to the thread, or (still better) in a point.

I should be sorry to do Mr. Hodgson any injustice; and therefore I will say that possibly the passages upon which I have been commenting are intended less as a direct demonstration of the Uniformity of Nature than as an indirect metaphysical criticism of the limits of science and empirical thought: and regarded in that way they certainly contain much that is valuable and abundant suggestions. Only in this way, too, can one explain why at starting we are promised a metaphysical basis for science, and toward the end are instructed that the axiom which has been elucidated is only available in science on "the supposition of oneness taking the place of recurrence"; in other words, that recurrent similars are identical, which, of course, they never are: that is to say, Mr. Hodgson has laid in philosophy a basis for science upon which, by his own showing, science does not and cannot be made to stand.[1]

Turning to our author's treatment of the more special problem of Induction, we find him undertaking to show that induction is a case of syllogism, "when you take both syllogism and induction in their true sense, and analyse the lowest and simplest acts of each". In order to do this, "two things must be distinguished; there is induction a *method* of investigation, and there are the several acts of observation, the facts observed brought together one by one, from which the method takes its name *induction*, ἐπαγωγή, or fact upon fact. The observation of a single fact is not, but the observation of two facts together is, an induction. Induction as a *method* depends on the use of hypothesis by

[1] Since this review was written, Mr. Hodgson has written an article (MIND XVI,) in further explanation of his views of Causation. He there observes that the elements of our notion of Causation are Uniformity and Efficacy. To seek the source of these elements he turns to the perceptual order, and finds the source of our notion of Uniformity in the similarity of all states of consciousness, amounting to sameness in respect of their Time-form; and the source of our notion of Efficacy in the continuity of consciousness. In defining Cause, however, he carefully omits the elements of invariableness, and thereby (as it seems to me) uniformity as commonly understood.

It would have increased the interest of the article "On Causation" if its author had shown explicitly its relation to the discussions of similar topics in the *Philosophy of Reflection*.

imagination" (I., p. 346). At p. 305 he has explained that "an imagined order, in which facts already known find their place and their explanation, is a scientific hypothesis; and the new facts ranged with the old under the hypothesis are an induction, and result in an inductive generalisation". But the analysis of induction as a method is into *acts* of induction, *i.e.*, acts combining two severally observed facts. "Now, I say," he continues (p. 346), "that the combining two severally observed facts is a process of reasoning which is syllogistic in its nature"; and he gives the following example—"This piece of Iceland spar has double refraction; this piece of Iceland spar is a crystal; therefore, this crystal has double refraction."

It must be admitted that the majority of logicians (against a minority of very respectable dissentients) would call this a syllogism; but few would confound it with induction. "The several acts of observation, the observed facts, brought together one by one, from which the method takes its name induction," are always understood to be similar facts, such as may be the basis of a generalisation. And in a passage above-quoted Mr. Hodgson seems to agree with the common view that an induction results in generalisation. But that Iceland spar has the property of double refraction, and that it is a crystal, are different facts; and how can any accumulation of such different facts ever lead to a generalisation? That, however, is the very matter at issue. The question is not whether in the syllogism a conclusion can be drawn from two singular premisses, but whether the conclusion can be wider than the premisses; whether it is possible to argue syllogistically from particular facts to a more general law. There have been several fallacious attempts at this, to which the above must be added.

On the whole, it is to be feared that both in solving old problems and in establishing new truths Mr. Hodgson has accomplished less than might have been anticipated from his conspicuous ability and his promising first principles. The reason perhaps is that he has aimed at greater independence than is permitted to mortals. To work effectively, men must pull together. The independent philosopher, who hopes to renew the universe of thought by his own creative energy, usually ends by galvanising old disputes and inventing new vexations. It is better to repeat an old truth than to formulate a new error. To repeat is to corrupt,—often, no doubt, unless with "a spirit and judgment equal or superior". But had not philosophers subordinated themselves in schools and begun with repetition, the common stock of metaphysical truth would still have remained what the taunting spirit says it has been in all ages. Audacity and docility are the Scylla and Charybdis of

inquiry; and must themselves (if I may use so violent a figure), by a fortunate consent, direct the ship that safely sails between them. Only those have added to the edifice of knowledge who have had the docility to build upon foundations already laid, and the audacity to extend and improve the designs. And these are chiefly of two classes, the prosecutors of mathematics and the physical sciences, and English empirical philosophers. Their buildings, rising and strengthening with each generation, endure from age to age, and show like the dwellings of civilised men, compared with the tents and wigwams of wandering tribes.

Not that Mr. Hodgson has failed to study the works of his forerunners; on the contrary, there are few modern English books which contain so much evidence as his do of extensive acquirements in the learning appropriate to their subject. In this respect his pages sometimes remind one of Schopenhauer's. But then he seems to regard the works of others as not so much sources of instruction as objects of criticism. And after all, perhaps, he does so from a true instinct; for in criticism his power seems to lie. This was already plain in his work on *Time and Space*, which contains nothing better than the criticism of Hegel. The critical matter scattered throughout his volumes is very instructive; and had criticism been made their central purpose, their value must have been greatly raised.

Hence he writes, of course, with a distinct idea of the relations in which his own system stands to others; and he traces its genealogy through Maimon and Kant to Hume. Coleridge's influence by way of inspiration and suggestion he commemorates with gratitude. Beyond Hume his line runs back, I suppose, to Locke, in virtue of the doctrine that "the nexus of percepts is prior to the nexus of concepts"; and the same doctrine he presents as the fundamental distinction of his own philosophy in comparison with Hegel's. The post-Kantian absolutism he calls an episode in history; but Hegel's influence upon him is everywhere manifest.

If, however, on the whole, his philosophy is a branch of the English school, it is one that departs from the main stem very near the roots. He necessarily separated himself from the principal disciples of Locke when at some early date he misunderstood the Laws of Association. In the *Philosophy of Reflection* he gives the following laws of "spontaneous redintegration": (1) The redintegration is a sequence at once continuous and discrete; while in proportion to (2) its vividness, or (3) its frequency of recurrence, or (4) its pleasurableness or interest, is a feeling likely to recur. The first of these is similar to the law of general relativity; and the rest are sufficiently familiar: but we miss from the list the

laws of similarity and contiguity.[1] For arguments in support of Mr. Hodgson's view of this matter the reader is referred to *Time and Space*, §§. 28, 29, 30; and *The Theory of Practice*, Vol. I., §. 53. On turning to the former passage, I find three arguments alleged to show that the laws of contiguity, similarity, contrast, and cause and effect, cannot be laws of spontaneous redintegration. In the first place, he observes, this list of laws "gives us no law of the preference of contrast to resemblance, contiguity in place or in time, cause or effect, or in short of the preference of any of these to any other of them; still less does it give us any law of preference within the selected category, or point out which among the causes or effects or objects resembling or in contrast is to succeed to the object with which we start". To this it may be replied: (1) That no one would now maintain that contrast and cause and effect are ultimate principles of association; and if we adopt Mr. Spencer's view, that likeness of relationality in time and place is the true basis of association by contiguity, the list of laws is reduced to one, and the first part of the above objection entirely destroyed. (2) Even if we admit both contiguity and similarity as ultimate principles of association, it must be remembered that the actual revival of a feeling seldom depends upon a single bond of association, but is frequently determined by the combined strength of numerous incentives, and that the successful feeling often seems to come triumphantly into consciousness only after a struggle with powerfully supported competitors. (3) "A law of preference within the selected category" is usually understood to be given, in that (other things equal) the revivability of feelings is proportionate to the degree of their likeness or of their former contiguity to the present feeling. (4) It is not to be supposed that psychologists maintain the laws of resemblance and contiguity, to the exclusion of the laws of vividness and frequency of occurrence; on the contrary, these latter circumstances are recognised as continually giving superior strength to some associations over others.

But it is to Mr. Hodgson's second argument that I wish especially to draw attention. Circumstances of resemblance, contiguity, &c., are, he says, "calculated to form links only in voluntary and not in spontaneous redintegration," because "the explanation supposes that I pass from one object of consciousness to another through the representation of a relation of a certain kind, a relation either of cause or resemblance or so on". No wonder that after this he objects, in the third place, that

[1] The laws of similarity and contiguity are, in the next chapter, recognised as true of "voluntary redintegration": but thus to narrow their scope is to miss all their value.

"supposing we did pass from one object to another through some one or other of these notions as the connecting link, we should still require an explanation of the link which connects that link itself with the redintegrating object or object beginning the redintegration". Undoubtedly; but where did Mr. Hodgson ever fall in with an empirical psychologist who dreamt that, before one feeling can suggest another resembling it, the general notion of resemblance must intervene? The law states, of course, that one feeling tends to suggest another like it by the particular fact of their likeness; or that, however it works, feelings do remind us of others similar to themselves. And similarly with the law of contiguity.

Entertaining such views of the meaning of the Laws of Association, it was impossible that Mr. Hodgson should go far in company with modern disciples of Locke; for it was impossible that he should well appreciate the profound truth of those laws, and their extensive powers of interpreting mental phenomena. On this account many of his psychological investigations are isolated from the main course of inquiry on the subject; and his analysis of the minima of consciousness, his explanation of memory, his criticism of reasoning processes, &c., though displaying much subtlety, fall short of the success which is due to such sincere efforts.[1]

Let us now consider, in conclusion, the other side of Mr. Hodgson's philosophy. He makes it the distinction of his system, in comparison with Ontology or Absolutism, that it has, besides the analytic (of which we have hitherto treated), a constructive branch. Of this he treats in many passages, but especially in the Preface, in ch. i. § 3, and in the final chapter. Philosophy must, he says, embrace the whole of existence, and no philosophy can be true which does not enable "those who hold it to give the freest scope at once to their intellectual and their religious tendencies". Numerous attempts to build systems of the requisite breadth and height have been made by ontologists, but they have failed by proceeding always on a wrong method. Before drawing the outlines of his own construction, Mr. Hodgson examines the Scholastic or Church Philosophy in his penultimate chapter, and after giving many

[1] At the same time it must be said that the effort to the reader is greatly aggravated by the author's strange use of philosophical language. It is long before one can bring oneself to realise and believe that he means by Comprehension what others mean by Extension, and *vice versâ*. For Intension he finds a new meaning, and quite justifiably, since it is absurd to keep two good words, Intension and Comprehension, to express the same idea. But as much cannot be said for his perversion of the word Concept; and we have already seen other instances of a similar procedure.

admirable proofs of what seem to me to be his special powers, concludes with these words :—

"If it is true that the fortunes of mankind, and even its continued existence are bound up with the maintenance of true morality in life and conduct, and that the maintenance of morality again largely depends upon its being enforced and vivified by religion, it becomes an imperative duty at all hazards to tear religion away from a dogma which sets it at variance with the free exercise of thought" [by imposing a forgone conclusion] "and weakens the authority of its sanction by undermining its claims upon the intellect. At the same time the other and positive side of the same task, the negative side being provided for, becomes more than ever important; namely, to exhibit religion as not torn away from, but more closely than ever leaning on, its true supports in the unseen and eternal world; and as, in this way, bringing to bear the whole weight of our conceptions regarding that world to uphold and sanction whatever conscience shall determine to be holy and just and good."

This task, then, remains to the Constructive Branch of Philosophy. But is there a Constructive Branch of Philosophy? Is there an Unseen World?

"To ask this question," says Mr Hodgson, "is one and the same thing as asking whether Time, Space, Feeling, the Postulates of Logic, and the Axiom of Uniformity, or any of them, have universal and necessary validity, that is to say, a validity beyond the particular combinations or instances of them with which we are acquainted in the actual world" (ii., p. 171; cf. p. 233). If this be admitted the seen and the unseen worlds together make up the universe; within which their boundaries may be demarcated thus: "The seen world contains whatever is or may possibly become an object of *direct* perception and thought to beings constituted as men are. The unseen world contains all that is or may be an object of *reflective* perception and thought to beings constituted as men are, if at the same time this object is or may be an object of *direct* perception and thought to other differently endowed beings" (p. 236).

Now, Time and Feeling, Mr. Hodgson finds, must enter into the unseen world, since they are necessarily involved in reflective perception, and without them there can be no consciousness and no existence. The Postulates and Axiom, too, he argues, must hold good there; but as to Space there is less certainty, inasmuch as it is not inseparably involved in all kinds of feeling but only in tactual and visual sensation, and we have no assurance that these specific modes of feeling obtain beyond the sphere of our own direct perception.

It must also be concluded that the unseen world has the characteristic of being capable of improvement; for the distinction of better and worse is involved in the cognitive act; and the cognitive act (at once action and cognition, the common source of practice and ethics, thought and theoretical philosophy) takes place whenever Time and Feeling come under the postulates. Attention, the first moment of cognition, is always expectance—expectance of something which it would be better for us to know, or feel, or do, than not.

"It may be said (continues Mr. Hodgson) on the other side, that we cannot conceive a better without a worse; and that deterioration is therefore equally [with improvement] essential to our conception of existence. But though it is true that we cannot conceive the one without the other, yet (and this is what I mean to point out as remarkable), the order in which the two, better and worse, come forward in conceiving existence is fixed and essential to the conception. It is an order from worse to better, and not reversely. In the act of cognition the worse is first, the *terminus a quo*, the better last, the *terminus ad quem;* the worse is at the beginning, the better at the end. This constitution of the cognitive act is the basis of Teleology" (p. 253). And thus "with a full and manifold content of thought" the cognitive act becomes "effort to make the good prevail, expectation that it will prevail. It becomes the formation of ideals."

On the other hand, some facts of the seen world are not necessarily included in the unseen. The only personality, for instance, which is necessarily included in all existence is on the subjective side, whereas the unseen world is a part of the objective aspect. Immortality, too, is not necessarily a characteristic of that world. "The subjective aspect of the whole universe is sufficiently provided for by the individual's reflective consciousness here and now. It is not necessary to imagine this reflective consciousness existing objectively with an extent and duration equal to those of its objective aspect the universe." The inclusion of personality and immortality in the unseen world Metaphysical Analysis neither affirms nor denies: the affirmation, if possible, is possible only to Constructive Philosophy.

Mr. Hodgson next indicates the method and problems of Constructive Philosophy. The method is to assume a law of continuity, and to consider how the phenomena of the seen world may be supplemented and completed in the unseen. Thus, (1) as to the *form* of phenomena, there arise the problems whether other modes of form besides Time and Space may exist in the unseen world; whether Time may have a second, and Space a fourth dimension there. (2) As to the possible incompletion of modes of *feeling and form together* in the seen world, we may inquire, what conditions in the unseen precede or accompany the origin of physical matter in space; or as to the connexion of consciousness with physical matter. (3) As to the completion in the unseen of modes of *feeling* uncompleted in the seen, our inquiry is limited to the possible completion and further development of the emotions, since in these the other department of feeling, the sensations, are themselves completed. And this inquiry becomes ethical; by which means alone the conception of a supreme intelligence or personality can be reached. Practical reasoning is teleological, aiming at ideals; and thus "inevitably and instinctively carries us over by its idealising method from the seen world to the unseen as containing its idealisation," and especially the

idealisation of emotion as that which most suggests the possibility of development.

"The imagery which embodies the reflective emotions consists in imagining those emotions to be felt and reciprocated by persons. When we idealise by intensifying those emotions, we introduce personality into the unseen world. . . . But the only way in which we can idealise personality, when intensifying its emotional soul or content, is on the one hand to abstract as much as possible from all corporeal attributes, and on the other to retain in the greatest strength all mental or spiritual attributes, whether of intellect, volition, or emotion. In this way it is that we imagine the ideal personality of God."

God cannot be regarded as a first cause ; for a cause, being separate from its effect, is limited by it, and therefore finite ; and a finite being cannot be God, because "we could not love with the whole mind and heart a finite Being, however powerful or beneficent". And "if we retain the word Creator to designate the spirit of the whole, it must be understood in a sense from which the notion of origination *ex nihilo* is excluded. It is coeval with the whole of which it is the spirit. Neither is it itself the whole, but only its informing spirit. It may be conceived as standing to the universe in the same relation as the mind of a man stands to the man and his earthly history."

These facts established by ethical reasoning concerning the unseen world, react upon practice, bringing to bear upon it the "sanctions of eternity". The judgments of conscience are enforced by the consideration, that actions done here may have in the unseen world consequences in which we may be sharers : and that superior intelligences, or a supreme being, may witness all that goes on in both worlds, the seen as well as the unseen. The practical maxim most fit to govern all application of ethical science is, "So act as if your action in all its parts, all its motions was witnessed by beings of perfect intelligence".

In this brief and necessarily inadequate exposition of Mr. Hodgson's Constructive Philosophy, I have abstained from criticism. The construction has plainly proceeded upon the ancient but discredited rule of architecture — to eke out one hypothesis with another. But this method of cumulative hypothesis is really a very difficult one to manage, though it looks easy and is proportionately seductive. For hypotheses about the entities or nonentities of metaphysical abstraction are less easy to remember than phenomena or laws of phenomena which can be really seen or imagined. This is the chief difficulty in establishing coherence in an ontological system. And this perhaps is partly why the last chapters of the *The Theory of Practice*, which treat of Practical Science, seem far better than anything Mr. Hodgson has done in Metaphysics or in Constructive Philosophy. In that one chapter which I have just been giving an account of, I find the following apparent incoherencies. At p. 254, the author says that personality is not necessarily included in the unseen world : but at p. 236 he had said that the unseen must

be an object of direct perception to other beings; and since reflection, *i.e.*, self-consciousness, precedes direct perception in his view, those other beings must be reflective, that is, persons. Again, at pp. 257-8, he says the subjective aspect of the universe is not necessarily equal to the objective in extent and duration, but in earlier passages formerly quoted he says "the objective and subjective aspects are inseparable"; "aspect is a character co-extensive with the thing of which it is an aspect"; "existence means presence in consciousness"; "feeling" (which is an element of the unseen) "is a name for the subjective aspect alone". Once more, at p. 279, he argues that God defined as First Cause would be a separable and therefore finite being; because, if I understand this point, he would be limited in relation to the world, his effect; but at p. 284, we find that God is not the whole universe, but only its informing Spirit. Now, that which is neither the whole, nor separable from it, must be a part, and therefore limited in relation to the remainder and finite. A finite being however we cannot, it is said, love with the whole mind and heart, and therefore such a being is not God.

It is a common saying that those who do not speak the truth need good memories; and (if such a comparison may be drawn without offence) so do those who deal in speculations to which the names truth and untruth are as inapplicable as to a fairy tale: in both cases for the same reason, namely, that they have to make a multitude of statements agree together without the vivid impressions and corrections of actual experience.

Speculations about an unseen world seem to be an innocent exercise of fancy by way of amusement. Starting from the hypothesis that a certain primary consciousness, a menstruum of sub-sensitive elements of mind-stuff, a sort of psychical nebula, preceded consciousness as we know it, there seems no absurdity in supposing that in other regions of the universe this has differentiated into other forms of consciousness such as we cannot at all conceive. The individual beings who participate in them may not live in space nor even in time, nor have bodies, nor any sort of sensation or feeling such as we should recognise, since all these are part of and developed along with our mode of consciousness. Again, even within the universe known to us in space, there may be animals whose forms of perception and inference are probably very similar to ours, whilst the matter of them, their lists of sensations, may be very different. This notion is familiar from *Micromégas*, and rendered surprisingly definite by the remark, that between the highest sensible sound, having under 40,000 vibrations a second, and the slowest sensible ray of light, having about

400,000,000,000,000 undulations a second, a vast number of rhythmic motions may exist, none of which have wrought any subjective correspondence in the human organism. It may, I suppose, be inferred that these unrepresented forces, if they do exist (which must depend upon the existence of an appropriate medium), are not of much use as signs or guides to inhabitants of our planet, or else a correspondence would probably have been developed by selection; but they may be the most useful of all guides in some other world, and entirely fill the consciousness of its inhabitants.

Here then is a possible unseen world at two removes of intelligibility, and there can be no harm in indulging our fancy there, as long as it does not distract us from better certified realities. But is it conceivable that any religious inspiration should proceed from such surmises; any "sanctions of eternity" (however deserving a meaner name!) or strength of motive to aid and not to injure the men whom we know to live and suffer? From Time and Space, Feeling and the Postulates of Logic to the fear of God and the love of Man—how abrupt, how unnatural a transition! There is nothing so irreverent as Metaphysics. The only unseen worlds whose dwellers, by the virtue of imagination,

> "as from some far region sent,
> Can give us human strength and strong admonishment,"

are the world of effort which has brought us hither, and the world of fellowship and justice which does not yet appear.

CARVETH READ.

V.—JOHN STUART MILL (IV.).

WHAT I have to say on Mill's ten years from 1848 to 1858 may be conveniently introduced by a reference to the *Autobiography*, p. 237. He states that for a considerable time after the publication of the *Political Economy*, he published no work of magnitude. He still occasionally wrote in periodicals, and his correspondence with unknown persons on questions of public interest swelled to a considerable amount. He wrote, or commenced, various essays on human and social subjects, and kept a watch on the progress of public events.

The year 1850 was chiefly noted for the first important revision of the *Logic*, namely, for the third edition. He had to answer many attacks upon it, including a pamphlet by Whewell. As I was absent from London while this was going on, I had a good many letters from him, chiefly on Whewell's criticism, of

the weakness of which he had a very decided opinion. I suggested some alterations and additional examples, but I scarcely remember what they were. The edition was printed in November; and no revision of anything like the same extent was undertaken till the eighth edition came out in 1872.

The *Political Economy* was subject to more frequent revisions, and occupied a good deal of his attention at one time or other, but I did not keep pace with him on that subject.

In spring, 1851, took place his marriage to Mrs Taylor. In autumn of that year, I took up my abode in London again, and remained there, or in the neighbourhood, till 1860. I continued to see him at intervals, in the India House, but he had changed his residence, and was not available for four o'clock walks. He could almost always allow a visitor fifteen or twenty minutes in the course of his official day; and this was the only way he could be seen. He never went into any society, except the monthly meetings of the Political Economy Club. On some few occasions a little after his marriage, Grote and he and I walked together between the India House and his railway station.

Only three of his reprinted articles belong to the period I am now referring to; but he must have written for the *Westminster Review* at least one or two that were not reprinted. I cannot help thinking that the failure of his energy was one chief cause of his comparative inaction. As an instance, I remember, when he first read Ferrier's *Institutes*, he said he felt that he could have dashed off an article upon it in the way he did with Bailey's book on Vision: and I cannot give any reason why he did not.

He wrote for the *Westminster*, in 1849, a vindication of the French Revolution of February, 1848, in reply to Lord Brougham and others. In French politics he was thoroughly at home, and up to the fatality of December, 1851, he had a sanguine belief in the political future of France. This article, like his "Armand Carrel," is a piece of French political history, and the replies to Brougham are scathing. I remember well, in his excitement at the Revolution, his saying that the one thought that haunted him was—Oh, that Carrel were still alive!

It was for the *Westminster* of October, 1852, that he wrote the article on Whewell's *Moral Philosophy*. What effect it had upon Whewell himself I cannot say; he took notice of it blandly in a subsequent edition of his *Elements of Morality*, in reviewing objectors generally, omitting names. John Grote thought that in this and in the "Sedgwick" article, Mill indulged in a severity that was unusual in his treatment of opponents. I could not, for my own part, discover the difference. Yet it is no wonder, as he told me once, that he avoided meeting Whewell

in person, although he had had opportunities of being introduced to him (I suppose through his old friend Mr Marshall, of Leeds, whose sister Whewell married).

In 1853, he wrote his final article on Grote's *Greece*, in which he enters with enthusiasm into Grote's vindication of the Athenians and their democratic constitution. He was, quite as much as Grote, a Greece-intoxicated-man. Twice in his life he traversed the country from end to end. I remember, when I met him at the India House after his first tour, he challenged me to name any historical locality that he had not explored.

In 1854, he had an illness so serious that he mentions it in the *Autobiography*. It was an attack in the chest, ending in the partial destruction of one lung. He took the usual remedy of a long tour, being absent about eight months, in Italy, Sicily and Greece. I remember Sir James Clark giving a very desponding view of his state; the local disease, however, he said, was not so serious as the general debility, and, in all likelihood, he never would be fit for any other considerable work. According to a remark made to Grote by Peacock, the head of his office, his absence was severely felt at the India House. He rallied, nevertheless, and resumed his usual routine.

In the year following his recovery, 1856, his two seniors in the Examiner's office retired together, and he became head of the office. This made an entire change in his work; instead of preparing despatches in one department, he had to superintend all the departments. The engrossment of his official time was consequently much greater; and he had often to cut short the visits of friends. In little more than a year after his promotion, in the end of 1857, the extinction of the company was resolved upon by the Government, and he had to aid the Court of Directors in their unavailing resistance to their doom. For this purpose he drafted the *Petition to Parliament* in behalf of the Company, in which he brought to bear all his resources in the theory and practice of politics. The Petition, as ultimately submitted, after some slight amendments by the Court of Directors, was pronounced by Earl Grey the ablest state-paper he had ever read. I do not mean to advert to its contents, further than to quote the two introductory sentences, the point and pungency of which the greatest orator might be proud of:—

"That your Petitioners, at their own expense, and by the agency of their own civil and military servants, originally acquired for this country its magnificent empire in the East.

"That the foundations of this empire were laid by your Petitioners, at that time neither aided nor controlled by Parliament, at the same period at which a succession of administrations under the control of Parliament were losing to the Crown

of Great Britain another great empire on the opposite side of the Atlantic."

Several other documents were prepared by Mill for the Court of Directors, while the abolition of the Company was under discussion in Parliament. It so happened that the Liberal Government, which first resolved on the measure, retired from office before it was carried, and the Government of Lord Derby had to finish it. Under the management of Lord Stanley, as President of the Board of Control, the new India Council was much more assimilated to the constitution of the old Court of Directors; and I am inclined to believe that the modification was in great measure owing to the force of Mill's reasonings.

The passing of the Bill led to his retirement from the India House. He told Grote that, but for the dissolution of the Company, he would have continued in the service till he was sixty. An attempt was made to secure him for the new Council. After the Chairman, he was the first applied to by Lord Stanley to take office as a Crown nominee. In declining, he gave, as his reason, failing health: but had he been stronger, he would have still preferred retirement to working under the new constitution.

His deliverance from official work in 1858 was followed by the crushing calamity of his wife's death. He was then on his way to spend the winter in Italy, but immediately after the event, he returned to his home at Blackheath. For some months, he saw nobody, but still corresponded actively on matters that interested him. His despondency was frightful. In reply to my condolence, he said "I have recovered the shock as much as I ever shall. Henceforth, I shall be only a conduit for ideas." Writing to Grote, he descanted passionately on his wife's virtues: "If you had only known all that she was!"

In the beginning of 1859, I was preparing for publication my volume on *The Emotions and the Will*. I showed the MS. to Mill, and he revised it minutely, and jotted a great many suggestions. In two or three instances, his remarks bore the impress of his lacerated feelings.

He soon recommenced an active career of publication. The *Liberty* was already written, and, as he tells us, was never to be re-touched. His pamphlet on *Parliamentary Reform*, written some years previously, was revised and sent to press. On this he remarked in a letter:—"Grote, I am afraid, will not like it, on account of the ballot, if not other points. But I attach importance to it, as a sort of revision of the theory of representative government." A few days later, he wrote—"Grote knows that I now differ with him on the ballot, and we have discussed it together, with no effect on either".

Of course the pamphlet was well reasoned, but the case against the Ballot had not the strength that I should have expected. The main considerations put forward are these two—first, that the electoral vote is a trust, and therefore to be openly exercised; second, that, as a matter of fact, the coercion of the voter by bribery and intimidation has diminished and is diminishing. The argument from "a trust" was not new; it had been repeatedly answered by Grote and by others. The real point at issue was—whether the withdrawing the elector from the legitimate control of public opinion, be not a less evil than exposing him to illegitimate influence; and this depends on the state of the facts as to the diminution of such influence. Experience seems to be against Mill on this head: and it is unfortunate for his political sagacity and prescience, that the Legislature was converted to the ballot, after he had abandoned it.

The *Liberty* appeared about the same time. The work was conceived and planned in 1854. While thinking of it, he told Grote that he was cogitating an essay to point out what things society forbade that it ought not, and what things it left alone that it ought to control. Grote repeated this to me, remarking—"It is all very well for John Mill to stand up for the removal of social restraints, but as to imposing new ones, I feel the greatest apprehensions". I instantly divined what the new restraints would be. The volume must have been the chief occupation of his spare time during the last two years of his official life. It is known that he set great store by the work; and thought it would probably last longer than any of his writings, except perhaps the *Logic*.

The old standing question of Freedom of Thought had been worked up, in a series of striking expositions, by his father, in conjunction with Bentham, and the circle of the *Westminster Review;* he himself, from his earliest youth, was embarked in the same cause, and his essays were inferior to none in the power and freshness of the handling. The first part of the *Liberty* is the condensation of all that had been previously done; and for the present, stands as the chief text-book of Freedom of Discussion. It works round a central thought, which has had a growing prominence in later years, the necessity of taking account of the *negative* to every positive affirmation; of laying down, side by side with every proposition, the *counter-proposition*. Following this cue, Mill's first assumption is, that an opinion authoritatively suppressed may possibly be true; and the thirty pages devoted to this position show a combination of reasoning and eloquence that has never been surpassed, if equalled, in the cause of intellectual freedom. The second assumption is that an opinion is false. Here his argument takes

the more exclusive form of showing the necessity of keeping in the view the opposite of every opinion, in order to maintain the living force of the opinion itself. While there is much that is effective here also, I think that he puts too great stress upon the operation of negative criticism in keeping alive the understanding of a doctrine. It is perfectly true that when an opinion is actively opposed, its defenders are put on the *qui vive* in its defence; and have, in consequence, a far more lively sense of its truth, as well as a juster view of its meaning and import; but the necessity of keeping up imaginary opponents to every truth in science may easily be exaggerated. We need not conjure up opponents to gravitation so long as a hundred observations and a hundred thousand ships are constantly at work testing its consequences. This is the substitute that Mill desiderates (p. 80) for the disadvantage of the cessation of controversy in truths of great magnitude.

When he proceeds to illustrate the enlivening influence of negation by the case of ethical and religious doctrines, I think he fails to make out his case. It may be true enough that when a creed is first fighting for reception, it is at the height of its fervour, but the loss of power at a later stage is due to other causes than the absence of opponents. Mill's illustration from Christianity is hardly in point. Never since the suppression of pagan philosophy was Christianity more attacked than now; but we cannot say that the attacks have led, or are likely to lead, to a resuscitation of its spirit in the minds of Christians; the opposite would be nearer the truth.

The last branch of the argument for Free-Thought is constituted by Mill's favourite doctrine that conflicting doctrines usually share the truth between them. This view is, I think, both precarious in itself, and of very doubtful relevance to the author's main thesis. The example from the two state-parties—the party of order and the party of progress—will not stand a severe scrutiny. Not to mention, what he admits, that there is perfect freedom of discussion on the matter, the war of parties is, in point of fact, scarcely conducted according to his ideal. More to the point is the well-known passage on Christian Morality, which he regards as a series of half-truths, needing to be made up by truths derived from other sources. As far as his main purpose is concerned, I think all this belongs to the first branch of the argument and might have been included there; that first branch containing to my mind the real strength of the contention for Freedom of Thought.

The second half of the book is on Liberty of Conduct, as against the restraints of our social customs. This is introduced

by a chapter on Individuality, considered as one of the elements of well-being. Excellent as are many of the author's remarks, there are various openings for criticism. The chief thing that strikes me is the want of a steady view of the essentials of human happiness. I shall have to notice again the defects of Mill's Hedonic philosophy. I think that he greatly exaggerates the differences between human beings as regards the conditions of happiness. The community of structure in our corporeal and mental framework far exceeds the disparities; there are certain easily stated requisites, in the possession of which no one could be very unhappy; while the specialities needed to impart to a given individual the highest degree of felicity, are seldomer withheld by the tyranny of custom, than by causes that society cannot control. Mill pleads strongly for the energetic natures, for the exuberance of spontaneity and strong impulses. But energy as such is not thwarted; and the difficulty will always remain, that superabundant energy is exceedingly apt to trench upon other people's rights. Mill too closely identifies energy with originality or genius, and genius with eccentricity. In regard to all these characteristics, many fine distinctions need to be drawn over and above what Mill gives us. When he talks of the present state of Englishmen as a state of collective greatness and diminishing individuality, it takes a little reflection to see what he is driving at. Nor is his reference of the unprogressiveness of the East to the despotism of custom a wholly satisfactory explanation; the problem of stationary societies is still undecided.

The chapter following, entitled "The Limits to the Authority of Society over the Individual," helps us better to his real meaning. He lays it down as an axiom that society should interfere only in what concerns itself. One might suppose that this would have passed as an axiom, instead of being cavilled at on all hands. Why should society, more than any other entity, interfere with what does not concern it? Even accepting the axiom, we may yet work it in society's favour by those numerous pretexts whereby individual action is alleged to have social bearings; but to refuse the axiom itself argues some defect of intelligent comprehension.

As a piece of vigorous composition, this chapter is not inferior to any in the book; it is admirable as an exposition in practical ethics, and might be enshrined as a standing homily in the moral instruction of mankind. It does what homilies rarely do, namely, endeavour to draw precise lines between social duty and individual liberty; and reviews the more notable instances where society still tyrannises over minorities. Still, the instances adduced seem scarcely to justify the denunciations of the author;

they are the remains of past ages of intolerance, and are gradually losing their hold.

It is in his subsequent chapter of "Applications," that we seem to approach his strongest case; but it is little more than hinted at; I mean the relationship of the sexes. It hardly admits of question that any great augmentation of human happiness that may be achieved in the future, must proceed first upon a better standard of worldly circumstances, and next upon the harmonising and adjusting of the social relations. After people are fed, clothed, and housed, at a reasonable expenditure of labour, their next thing is to seek scope for the affections; it is at this point that there occur the greatest successes and the greatest failures in happy living. The marriage relation is the most critical of any; and we have now a class of thinkers that maintain that this is enforced with too great stringency and monotony. To attain some additional latitude in this respect is an object that Mill, in common with his father, considered very desirable. Both were strongly averse to encouraging mere sensuality; but, though not prepared with any definite scheme of sexual reform, they urged that personal freedom should be extended, with a view to such social experiments as might lead to the better fulfilment of the great ideal that the sexual relation has in view.

The *Liberty* was exposed to a good deal of carping in consequence of Mill's admitting unequivocally that a certain amount of disapproval was proper and inevitable towards persons that behaved badly to themselves. It was said—What is this, after all, but a milder form of punishing them for what does not concern either us or society at large? He fully anticipated such a remark, and I think amply disposed of it, by drawing the very wide distinction between mere lowered estimation, and the treatment proper to offenders against society. He might have gone farther and drawn up a sliding scale or graduated table of modes of behaviour, from the most intense individual preference at the one end to the severest reprobation at the other. At least fifteen or twenty perceptible distinctions could be made; and a place found for every degree of merit and demerit. Because a person does not stand high in our esteem, it does not follow that we are punishing or persecuting him; the point when punishment in any proper sense could be said to begin would be about the middle of the scale. Mill remarks justly—"If any one displeases us, we may express our distaste and stand aloof from such an one; but we shall not therefore feel called on to make his life uncomfortable;" still less to send him to prison or to the stake.

Closely connected both in date of composition and in subject-

matter is the *Utilitarianism*. I find from a letter that it was written in 1854. It was thoroughly revised in 1860, and appeared as three papers in *Fraser's Magazine* in the beginning of 1861. I am not aware that any change was made in reprinting it as a volume, notwithstanding that it had a full share of hostile criticism as it came out in *Fraser*.

This short work has many volumes to answer for. The amount of attention it has received is due, in my opinion, partly to its merits, and partly to its defects. As a powerful advocacy of Utility, it threw the Intuitionists on the defensive; while, by a number of unguarded utterances, it gave them important strategic positions which they could not fail to occupy.

It is this last point that I shall now chiefly dwell upon. What I allude to more particularly is the theory of pleasure and pain embodied in the second chapter, or rather the string of casual expressions having reference to pleasures and pains. I have already said that I consider Mill's Hedonism weak. I do not find fault with him for not having elaborated a Hedonistic theory; that is a matter still ahead of us. My objection lies to certain loose expressions that have received an amount of notice from hostile critics out of all proportion to their bearing on his arguments for Utility. I think that, having opponents at every point, his proper course was not to commit himself to any more specific definition of Happiness than his case absolutely required.

It was obviously necessary that he should give some explanation of Happiness; and on his principles, happiness must be resolved into pleasure and the absence of pain. Here, however, he had to encounter at once the common dislike to regarding pleasure as the sole object of desire and pursuit; "a doctrine worthy only of swine," to which its holders have both in ancient and in modern times been most profusely likened. He courageously faces the difficulty by pronouncing in favour of a difference in *kind* or *quality* among pleasures; which difference he expands through two or three eloquent pages, which I believe have received more attention from critics on the other side than all the rest of the book put together. My own decided opinion is that he ought to have resolved all the so-called nobler or higher pleasures into the one single feature of including with the agent's pleasure the pleasure of others. This is the only position that a supporter of Utility can hold to. There is a superiority attaching to some pleasures that are still exclusively self-regarding, namely, their amount as compared with the exhaustion of the nervous power; the pleasures of music and of scenery are higher than those of stimulating drugs. But the superiority that makes a distinction of *quality*, that rises clearly

and effectually above the swinish level, is the superiority of the gratifications that take our fellow-beings along with us; such are the pleasures of affection, of benevolence, of duty. To have met opponents upon this ground alone would have been the proper undertaking for the object Mill had in view. It surprises me that he has not ventured upon such a mode of resolving pleasures. He says—"On a question which is the best worth having of two pleasures, or which of two modes of existence is the most grateful to the feelings, *apart from its moral attributes and consequences*, the judgment of those who are qualified by knowledge of both, must be admitted to be final." Apart from moral attributes and consequences, I do not see a difference of quality at all; and when these are taken into account, the difference is sufficient to call forth any amount of admiring preference. A man's actions are noble if they arrest misery or diffuse happiness around him; they are not noble if they are not directly or indirectly altruistic; his pleasures are essentially of the swinish type.

Still rasher, I think, is his off-hand formula of a happy life,[1] if he meant that this was to be a stone in the building of a Utilitarian philosophy. As a side-remark upon some of the important conditions of happiness, it is interesting enough, but far from being rounded or precise. It was only to be expected that this utterance should have the same fate as Paley's chapter on Happiness, namely, to be analysed to death, and have its mangled remains exposed as a memento of the weakness of the philosophy that it is intended to support. It was clearly his business in conducting a defence of Utility, to avoid all questionable suppositions, and to be content with what everybody would allow on the matter of happiness.

His third chapter, treating of the Ultimate Sanction of the Principle of Utility, has been much cavilled at in detail, but is, I consider, a very admirable statement of the genesis of moral sentiment under all the various influences that are necessarily at work. Here occurs that fine passage on the Social feelings of mankind, which ought, I think, to have been the framework or setting of the whole chapter. Perhaps he should have avoided the word "sanction," so rigidly confined by Austin and the jurists to the penalty or punishment of wrong.

The real stress of the book lies in the last chapter, which is well reasoned in every way, and free from damaging admissions.

[1] Happiness was "not a life of rapture; but moments of such, in an existence made up of few and transitory pains, many and various pleasures, with a decided predominance of the active over the passive, and having as the foundation of the whole, not to expect more from life than it is capable of bestowing".

Under the guise of an inquiry into the foundations of Justice, he raises the question as to the source of duty or obligation, and meets the intuitionists point by point in a way that I need not particularise.

By far the best hostile criticism of the *Utilitarianism* that I am acquainted with, is the posthumous volume of Prof. John Grote. It will there be seen what havoc an acute, yet candid and respectful, opponent can make of his theories of happiness. Many of those strictures I consider unanswerable. Prof. Grote also makes the most of Mill's somewhat exaggerated moral strain, and his affectation of holding happiness in contempt; "doing without it," if need be.

It was in 1860 that he wrote his volume on *Representative Government*. The state of the Reform question, which led him to prepare his pamphlet on Reform, was the motive of the still larger undertaking, his principal contribution to a Philosophy of Politics. He says in the Preface, that the chief novelty of the volume is the bringing together, in a connected form, the various political doctrines that he had at various times given expression to; but the mere fact of viewing them in connexion necessarily improved their statement and bearings; and the six or eight months' additional elaboration in his fertile brain could not but infuse additional freshness into the subject.

In my estimate of Mill's genius, he was first of all a Logician, and next a social philosopher or Politician. The *Political Economy* and the *Representative Government* constitute his political outcome. People will differ as to his political conclusions, but certainly any man that wishes to judge of any matter within the scope of the *Representative Government* should first see what is there said upon it; and the work must long enter into the education of the higher class of politicians. The chapter on the "Criterion of a good form of Government" contains an exceedingly pertinent discussion of the relation between Order and Progress; and demonstrates that Order cannot be permanent without Progress: a position in advance of Comte. The third chapter demolishes the fond theory entertained by many in the present day that the best government is "Absolute authority in good hands". Then comes a question that needs all the author's delicacy, tact, and resource,—Under what conditions is representative government applicable? But his strongest point throughout is the exposition of the dangers and difficulties attending on Democracy. This was one of his oldest themes in the *Westminster Review;* he has put it in every possible light, and discussed with apostolic ardour all the contrivances for withstanding the tyranny of the majority. He took up

with avidity Mr. Hare's scheme of Representation, and never ceased to urge it as the greatest known improvement that representative institutions are suseeptible of. He dismisses Seeond Chambers as wholly inadequate to the purpose in view, however useful otherwise. The discussions on the proper functions of the Loeal Governing Bodies, on Dependeneies, and on Federations are all brimful of good political thinking. He passes by the subjeet of Hereditary Monarchy. Both he and Grote were republieans in principle, but they regarded the monarehy as preferable to the exposing of the highest dignity of the state to eompetition. From my latest eonversations with Mill, I think he coineided in the view that simple Cabinet Government would be the natural substitute for Monarehy.

In 1861 he began to turn his thoughts to a review of Hamilton's Philosophy. Writing to me in November, he says, "I mean to take up Sir William Hamilton, and try if I can make an artiele on him for the *Westminster*". He chose the *Westminster* when he wanted free room for his elbow. He soon abandoned the idea of an article. In Deeember he said:—"I have now studied all Sir W. Hamilton's works pretty thoroughly, and see my way to most of what I have got to say respecting him. But I have given up the idea of doing it in anything less than a volume. The great recommendation of this projeet is, that it will enable me to supply what was prudently left defieient in the *Logic*, and to do the kind of service whieh I am eapable of to rational psyehology, namely, to its *Polemik*."

He was interrupted for a time by the events in America. In January, 1862, he wrote his paper on the Civil War in *Fraser*. He expeeted it to give great offenee, and to be the most hazardous thing for his influenee that he had yet done.

After spending the summer in a tour in Greeee and Asia Minor, he wrote again on the Ameriean Question, in a review of Cairnes's book in the *Westminster*. This done, he set to the *Hamilton*, whieh was the chief part of his oeeupation for the next two years. His interruptions were the article on John Austin in the *Edinburgh*, in Oct., 1863, the two artieles on Comte in the end of 1864, and the revision of the *Political Economy*.

I had a great deal of correspondenee with him while he was engaged with Hamilton. He read all Hamilton's writings three times over, and all the books that he thought in any way related to the subjeets treated of. Among other things, he wrote me a long criticism of *Ferrier's Institutes*. "I thought Ferrier's book quite *sui generis* when I first read it, and I think so more than ever after reading it again. His system is one of pure

scepticism, very skilfully clothed in dogmatic language." He was much exercised upon the whole subject of Indestructibility of Force. His reading of Spencer, Tyndall and others landed him in a host of difficulties, which I did what I could to clear up. His picture of Hamilton grew darker as he went on; chiefly from the increasing sense of his inconsistencies. He often wished that he was alive to answer for himself. "I was not prepared for the degree in which this complete acquaintance lowers my estimate of the man and of his speculations. I did not expect to find them a mass of contradictions. There is scarcely a point of importance on which he does not hold conflicting theories, or profess doctrines which suppose one theory while he himself holds another. It almost goes against me to write so complete a demolition of a brother philosopher after he is dead, not having done it while he was alive."

During my stay in London in the summer of 1864, he showed me the finished MS. of a large part of the book. I offered a variety of minor suggestions, and he completed the work for the press the same autumn.

Of the many topics comprised in the volume, I shall advert only to one or two of the principal. After following Hamilton's theories through ten chapters, he advances his own positive view of the Belief in an External World. Having myself gone over the same ground, I wish to remark on what is peculiar in his treatment of the question.

I give him full credit for his uncompromising Idealism, and for his varied and forcible exposition of it. In this respect he has contributed to educate the thinking public in what I regard as the truth. But in looking at his analysis in detail, while I admit he has seized the more important things, I do not exactly agree with him either as to the order of statement, or as to the relative stress put upon the various elements of the Object and Subject distinction.

In the first place, I would remark on the omission of the quality of *Resistance*, and of the muscular energies as a whole, from his delineation of the object or external world. In this particular, usage and authority are against him to begin with. The connexion of an External World with the Primary Qualities has been so long prevalent, that there must be some reason or plausibility in it. His own father and Mansel are equally emphatic in setting forth Resistance as the primary fact of Externality. Mill himself, however, allows no place for Resistance in his psychological theory. In a separate chapter on the Primary Qualities of Matter, he deals with Extension and Resistance, as products of muscular sensibility, and as giving us our notions of *Matter*, but he thinks that simple tactile sensi-

bility mingles with resistance, and plays as great a part as the purely muscular ingredient; thus frittering away the supposed antithesis of muscular energy and passive sensibility. Now, for my own part, I incline to the usage and opinion of our predecessors in putting forward the contrast of active energy and passive feeling as an important constituent of the subject and object distinction; and, if it is to be admitted at all, I am disposed to begin with it, instead of putting it last as Mr. Spencer does, or leaving it out as Mill does. It does not give all that is implied in Matter, but it gives the nucleus of the composite feeling, as well as the fundamental and defining attribute.

The stress of Mill's exposition rests on the *fixity of order* in our sensations, leading to a constancy of recurrence, and a belief in that constancy, going the length of assuming independent existence. Although he shows a perfect mastery of his position, I do not consider that he has done entire justice to it, from not carrying along with him the contrast of the objective and the subjective—the Sensation and the Idea. Indeed, the exposition is too short for the theme; the reader is apt to be satisfied with the portable phrase—"permanent possibility of sensation," which helps him to one vital part of the case, but does not amount to a satisfactory equivalent for an External and Independent World. There would have been more help in an expression dwelling upon the "common to all," in contrast with the "special to me," to use one of Ferrier's forms of phraseology. This ground of distinction is not left unnoticed by Mill, but it is simply mentioned.

His chapter on the application to our belief in the permanent existence of Mind is, I think, even more subtle than the preceding on Matter. The manner of disposing of Reid's difficulty about the existence of his fellow-creatures is everything that I could wish. It is when, in the concluding paragraph, he lays down as final and inexplicable the Belief in Memory, that I am unable to agree with him. This position of his has been much dwelt upon by the thinkers opposed to him. It makes him appear, after all, to be a transcendentalist like themselves, differing only in degree. For myself, I never could see where his difficulty lay, or what moved him to say that the belief in memory is incomprehensible or essentially irresolvable. The precise nature of Belief is no doubt invested with very peculiar delicacy, but whenever it shall be cleared up, it may very fairly be capable of accounting for the belief that a certain state now past as a sensation, but present as an idea, was once a sensation, and is not a mere product of thought or imagination. (*Cf. The Emotions and the Will*, 3d. edit., p. 532.)

I may make a passing observation on the chapter specially devoted to Mansel's *Limits of Religious Thought.* It is a considerable digression in a work devoted to Hamilton, but Mansel's book touched Mill to the quick; in private, he called it a "loathsome" book. His combined argumentative and passionate style rises to its utmost height. Mansel sarcastically described his famous climax—"to hell I will go"—as an exhibition of taste and temper. That passage was scarcely what Grote called it, a Promethean defiance of Jove, inasmuch as the fear of hell never had a place in Mill's bosom; it sprang from the strength of his feelings coining the strongest attainable image to give them vent.[1]

Mill could not help adverting to Hamilton's very strong and paradoxical assertions about Free-Will; but as he never elaborates a consecutive exposition of the question, I doubt the propriety of making these assertions a text for discussing it at full. Mill's chapter is either too much or too little; too much as regards his author, too little as regards the subject. The connexion of Punishment with Free-Will should be allowed only under protest; the legitimacy and the limits of punishment make a distinct inquiry. Punishment, psychologically viewed, assumes that men recoil from pain; there may be other springs of action besides pain or pleasure; but as regards such, both reward and punishment are irrelevant. I think Mill very successful in illustrating the independence of moral good and evil on the question of the Will. He is not too strong in his remonstrance against Hamilton's attempt to frighten people into Free-Will by declaring that the existence of the Creator hangs upon it. It was quite in Hamilton's way to destroy all the other arguments in favour of a doctrine that he espoused, in order to give freer course to his own. He damages the advocacy of Free-Will by his slashing antinomy of the two contrary doctrines. It is certainly a clearing of the ground, if nothing more, to affirm, as he does so strongly, that "a determination by motives cannot escape from necessitation". Such admissions give an opponent some advantage, but only as respects him individually. The general controversy, however, must proceed on different lines from his, and hence the waste of strength in following his lead.

Hamilton's attack on the study of Mathematics was a battery of learned quotations brought out to confound Whewell and Cambridge. It is not very convincing; it hardly even does what Mill thinks toleration of hostile criticism tends to do,

[1] Grote thought that the phrase was an echo of something occurring in Ben Jonson; where a military captain's implicit obedience is crowned by the illustration—"Tell him to go to hell, to hell he will go."

namely, bring out the half-truth neglected by the other side. It was not worth while to write so long a chapter in reply; but Mill, partly from what he learnt from Comte, and partly from his own logical studies, had a pat answer to every one of Hamilton's points. Most notable, in my view, is the paragraph about the disastrous influence of the mathematical method of Descartes in all subsequent speculation. He seems there to say that the *à priori* spirit has been chiefly kept up by the example of Mathematics. Now, I freely admit that the axioms of mathematics have been the favourite illustration of Intuition; but there is no certainty that, in the absence of that example, Intuitionism would not have had its full swing during the last two centuries. Mill admits that the crudity of Bacon's Inductive canons had an equally bad effect on English speculation; but all this shows simply that error is the parent of error.

The two subjects taken up while the *Hamilton* was still in hand—John Austin and Comte—deserve to be ranked among the best of his minor compositions. The "Austin" article took him back to his early days when he worked with Bentham and attended the lectures of Austin at University College. It does not seem to contain much originality, but it is a logical treat. The two "Comte" articles are still more valuable, as being Mill's contribution to the elucidation of Comte's Philosophy. It will be long ere an equally searching and dispassionate estimate of Comte be given to the world; indeed, no one can again combine the same qualifications for the work.

The publication of the *Hamilton* in the spring of 1865 was followed by a crowd of events. He had already embarked on an article on Grote's *Plato*, which had lately appeared. He had arranged with his publisher for cheap reprints of the *Political Economy*, the *Liberty*, and the *Representative Government*. Then came the requisition to stand for Westminster, by which his name blazed into a sudden notoriety, under which the cheap volumes went off like wildfire, while there was an increased demand for the *Logic*. His letter, announcing his compliance with the requisition on certain conditions, was a surprise. It was scarcely to be expected that he could feel himself "honoured" by being elected to Parliament, in the maturity of his great reputation. Perhaps we must go farther back to account for his ready compliance. He had felt it acutely as a disadvantage of his being placed in the India House that he could not enter Parliament; and again, in the days when he was heading the philosophic radicals, he was conscious of the weakness of his position in not being himself in the House of Commons. He had not yet ceased to be a practical politician, although he had

become many things besides; and the long slumbering idea of being in Parliament was suddenly wakened into life. His anticipation of success in the election was not sanguine; but his supporters were enthusiastic, and his appearances at the meetings of the electors procured daily accessions to his cause. Above all things, the attempts to entrap him by cunningly devised questions most signally recoiled upon the authors.

Half of his year for the next three years was given up to attendance in the House and engrossment with public questions. I am not about to criticise his career as a member of Parliament. The part of the *Autobiography* where he is perhaps most self-complacent, is what relates to his speeches and doings in those years. He set a good example of perfect party loyalty, combined with the assertion of difference of opinion on particular questions. For a number of years his relations with Mr. Gladstone had been far more cordial and intimate than the outer world was aware of. His idea of ventilating questions that had as yet scarcely any supporters appeared to me to be carried to an extreme. He was not an orator physically; but he composed and delivered speeches possessing all the qualities of his published writings, that is to say, original in thought, powerfully reasoned, and full of passionate fire when the occasion demanded.

In the six months' recess he carried on his philosophical and other writings. In the autumn and winter of 1865 he had to finish his long article on *Plato*, on which he bestowed great pains, having taken the trouble to re-read the whole of Plato in the original. To the reader of Grote, the article does not impart much that is absolutely new; but Plato being an early subject of his as well as of his father's, his handling has freshness and gusto.

The extraordinary stimulus given to the sale of his books prematurely exhausted the current edition of the *Logic;* and it had been his intention to revise it for the next edition (the Sixth). This had to be seen to, along with the "Plato," during the same recess. His revision, on this occasion, partly consisted in improving the "Induction" by new examples. I referred him to Brown Séquard's interesting research on Cadaveric Rigidity, and induced him to read the same author's volume of Researches on the Nervous System. I also obtained from Thomas Graham a complete set of his researches on Gases and Liquids: pointing his attention to what I thought most available. It was in this edition that he first combated Mr. Spencer's doctrine of "Inconceivability of the opposite" as a test of truth.

The same winter recess was not allowed to conclude without another distraction. The students of St. Andrews had, without

asking his leave, elected him Lord Rector. On its being announced to him, he wished to decline. This, however, was not easy after the thing was done; and he accepted on the understanding that he was not to deliver the Rectorial Address till next year.

Meantime, his letters to me were full of the notices that had come out on the *Hamilton*. When the session of 1866 was concluded, after a tour in the Alps and Pyrenees, he settled down at Avignon to write his Address for St. Andrews, and to answer the attacks on *Hamilton* for the third edition; both which feats he accomplished before the opening of the session of 1867.

The St. Andrews Address was a very lengthened performance; its delivery lasted three hours. It aimed at a complete survey of the Higher Education. Its absolute value is considerable; but in relation to the time, place, and circumstances, I consider it to have been a mistake. Mill had taken it into his head that the Greek and Roman classics had been too hardly pressed by the votaries of science, and were in some danger of being excluded from the higher teaching; and he occupies nearly half of the address in vindicating their importance. The second half is a vigorous enforcement of the claims of Science.

The performance was a failure, in my opinion, for this simple reason, that he had no conception of the limits of a University curriculum. The Scotch Universities have been distinguished for the amount of study comprised in their Arts Degree. Mill would have them keep up the Classics intact, and even raise their standard; he would also include a complete course of the Primary Sciences—Mathematics, Physics, Chemistry, Physiology, Logic, and Psychology, to which he would add Political Economy, Jurisprudence, and International Law. Now at present the obligatory sciences are Mathematics, Natural Philosophy, Logic, and Moral Philosophy. If he had consulted me on this occasion, I should have endeavoured to impress upon him the limits of our possible curriculum, and should have asked him to arbitrate between the claims of Literature and Science, so as to make the very most of our time and means. He would then have had to balance Latin and Greek against Chemistry, Physiology, and Jurisprudence; for it is quite certain that both these languages would have to be dropped absolutely, to admit his extended science course. In that case he would have been more careful in his statements as to the Greek and Latin languages. He would not have put these languages as synonymous with "literature"; and he would have made much more allowance for translations and expositions through the modern languages. He would have found that at the present day we

have other methods of correcting the tendency to mistake words for things than learning any two or three additional languages. He would not have assumed that our pupils are made all "to think in Greek"; nor would he have considered it impossible to get at the sources of Greek and Roman History without studying the languages. If he had had a real opponent, he would not have given the authority of his name to the assertion that Grammar is "elementary Logic". His mode of speaking of the style of the ancient writers, to my mind at least, is greatly exaggerated. "Look at an oration of Demosthenes; there is nothing in it which calls attention to itself as style at all". "The Athenians do not cry out—What a splendid speaker, but —Let us march against Philip." He also gives way to the common remark that the teaching of Latin and Greek could be so much improved as to make it an inconsiderable draft upon a pupil's energies. On this point he had no experience to go upon but his own, and that did not support his position.

In the scientific departments he carries out strictly the Comtean hierarchy of the fundamental sciences, and in this respect the address was valuable as against the mischievous practice of culling out a science from the middle of the series, say Chemistry, and prescribing it by itself to the exclusion of its forerunners in the hierarchy. While he speaks fairly and well on the Mathematical and Physical Sciences, his remarks on the Moral and Political display as usual the master's hand. From these he was led to talk of Free Thought, on which he maintained a somewhat impracticable ideal for our Universities. From Science he proceeded to Art, and enforced a favourite theme—the subservience of Poetry to Virtue and Morality. One feels that on this topic a little more discrimination was necessary; art being a very wide word. His conclusion was a *double entendre*. "I do not attempt to instigate you by the prospect of direct rewards, either earthly or heavenly; the less we think about being rewarded in either way, the better for us."

In the reception given to the Address he was most struck with the vociferous applause of the Divinity students at the Free-thought passage. He was privately thanked by others among the hearers for this part.

The Third Edition of the *Hamilton* contained replies to the host of critics that had assailed it. The additional scope given to the author's polemical force greatly enhanced the interest of the book. In answering the attacks made on his criticism of Hamilton's doctrines on the Relativity of Knowledge and Philosophy of the Conditioned, as well as in the reply to Mansel on

Religion, he showed to considerable advantage. In defending the Psychological Theory of the Belief in an External World, he grappled with the stock arguments against Idealism. He made least way in the Free-Will controversy; affording, as I think, a confirmation of the impolicy of carrying on so many extraneous questions together.

His next literary project was the editing his father's *Analysis*. This was commenced in the recess of 1867, and finished in the following year, being brought out early in 1869. I had necessarily a long correspondence with him on the allocation of topics; but each of us took his own line in regard to the doctrines. Coincidence of view was the rule; the discrepancy seldom went beyond the mode of statement, the chief exception being the topic of Belief. The work contains perhaps the best summary of his psychological opinions, although the *Hamilton* shows them in the more stirring shape of polemics.

Before this work came out his Parliamentary career was at an end. The circumstances that led to his defeat in the election of 1868 are detailed by himself. They included the singular indiscretion of his allowing his subscription to Mr Bradlaugh to be made public before his own election day; very unlike his usual circumspectness. His apology is somewhat lame; and does not take account of the fact that he was contesting the seat in the interest of other people and at their expense. So energetically did the opposition ply the weapon thus put into their hands that they may have owed their success to it alone. Although on public grounds he regretted being no longer in Parliament, he was not sorry to resume his quiet and his leisure for other work.

The pamphlet entitled *England and Ireland*, brought out in the beginning of 1868, declared, as he says, his whole mind on the subject of Ireland, chiefly as regarded the land, and is couched in very strong language indeed. He believed that this pamphlet helped to determine Mr. Gladstone to commence his Irish Legislation with the Church, leaving the Land to a later operation.

The year 1869, his first year of release, saw the publication of his last book—*The Subjection of Women*, together with the two first articles in his fourth volume of *Dissertations*—"Endowments," and "Labour and its claims," a review of Mr. Thornton's work on that subject.

The volume on the *Subjection of Women* he tells us was first written in 1861. It was, he says, a joint production; portions were written by Miss Taylor, while his share was the result of

innumerable conversations and discussions with his wife. However the merits be partitioned, it is a book of a very marked character. It is the most sustained exposition of Mill's life-long theme—the abuses of power. The extent of the illustration and the emphasis of the language render it the best extant homily on the evils of subjection in general; while the same arts are maintained in dealing with the application to the disabilities of women. This case, which of all others most engaged his feelings, is, I think, the one instance where he may be charged with overstraining. In discussing political freedom at large, he is always sufficiently alive to the necessities of government; in the present question, he leaves us to suppose that the relations of men and women between themselves may work upon a purely voluntary principle. He abstains here and elsewhere from advocating divorce pure and simple, because of the complications attending the question; while he does not show what is the remedy when a man and a woman united by the marriage bond are unable to co-operate as equal partners.

His handling of the mental equality of the sexes is, to my mind, open to exception. In the intensity of his special pleading on this question he hardly avoids contradicting himself, while he postulates a degree of equality that does not fall in with the experience of the least biassed observers. He grants that women are physically inferior, but seems to think that this does not affect their mental powers. He never takes account of the fact that the large diversion of force for the procreative function must give some general inferiority in all things where that does not come in, unless women are made on the whole much stronger than men. In an allusion to his experience of the government of India, he tells us that, in three cases out of four, if a superior instance of good government occurs, it is in a woman's reign; which looks like the fallacy of proving too much.

Without entering into an argument with him on his equality view, I expressed my doubts as to the expediency of putting this more strongly than people generally would be willing to accept it; inasmuch as the equality of rights did not presuppose absolute equality of faculties. He replied with much warmth, contending that the day of temporising policy was past; that it was necessary to show not simply that the removal of restrictions would leave things as they are, but that many women are really capable of taking advantage of the higher openings. And further, he urged, it was necessary to stimulate the aspirations of women themselves, so as to obtain proofs from experience as to what they could do.

A considerable portion of his labours during the last three years of his life was given to the Land Question, which he greatly

helped to mature for future settlement. Under this movement he renewed his old fight for peasant properties, and started the new heresy of the unearned increment. It was his pride to co-operate in all these questions with the working classes and their leaders, and had he lived, he would have been of unspeakable value as a mediator in the struggles between labour and capital, and between the working population generally and the heads of political parties. He would not, however, I think, ever have been a working-men's champion on their own lines. He would not have held out any tempting bribe of immediate amelioration such as to inspire the highest efforts of the existing generation. His greatest hopes were of a very slow progress in all things; with the sole exception, perhaps, of the equality-of-women question, on which his feelings went farther than on any other.

The posthumous *Essays on Religion* do not correspond with what we should have expected from him on that subject. Never, so far as I know, did he give any hint of wishing or attempting to re-construct a system of Theism on a scientific basis. In one sentence in the *Hamilton* he spoke approvingly of the argument from Design, but laid more stress on its persuasiveness than on its soundness. The *Autobiography* represented his attitude towards Religion as pure negation, or nescience, just as his father's had been.

The Essay on *Nature* paints the world black enough, and from that he was not likely to rise to a flattering estimate of Nature's God. I think he should have widened his survey considerably before pronouncing as he does. For although there are good grounds for many of his statements of fact, the case is by no means complete. By his own showing in other places, many happy lives have been passed in the world as we find it, and he looked forward to a time when happiness might be the rule instead of the exception. I should have expected him to push the analysis of the causes of evil a step further, namely, first, to the inadequacy of man's intellectual force to cope with the obscurities of nature, and next to the want of ability to counteract known causes of mischief. A remark that he once made regarding his own temperament, is a part of the case in considering nature; he said, in answer to some gloomy utterance of Grote's, that with himself the difficulty was not so much to realise pleasure as to keep off pain; and it is the fact that there are many pleasurable resources in the world if we could only submerge the attendant miseries. His exposure of the insufficiency of Nature as a *guide* is pure logic, and in that he was not likely to be wanting.

The Essay on the *Utility of Religion* is a farther illustration of his old theme (in the *Utilitarianism*) as to the sufficiency of the sanctions and motives of the present life for sustaining not only the inferior moral virtues, but also the elevated sentiments of mankind. He here puts forward a sort of Religion of Humanity, constructed on the basis of men's amiable feelings towards one another. To this he had been led, I have no doubt, in the first instance, by Comte, although the filling-up is his own.

But by far the most laboured of the Essays is the last—uniting a destructive and a constructive *Theism*. The destructive part is in accordance with all his antecedents; it is the constructive part that we were not prepared for. It was indeed quite compatible with his warm human sympathies, and with his long-standing doctrine that every creed is likely to contain some portion of truth, that he should try and ascertain what there was in religion to commend it to the best minds among its adherents; our doubt would have been whether, after painting the world in such gloomy hues, he could set up a Deity that would replace, in the hearts of men, the one that he undertook to destroy. Religion, we know, is exceedingly variable, but there are some things in it not easy to dispense with. Until the advent of the modern sentimental Theism, it has usually contained the idea of authority and subjection; the prescription of duties with rewards and punishments attached to them. Men's deities in all early ages had to be propitiated as powers capable of evil at least, if not also of good. In pure Monotheism, the unbounded beneficence of the Deity has been an indispensable attribute, in spite of the difficulties attending it. Plato insisted that this belief should be supported by state penalties; and we know how essential it is regarded in the present day by the Theists that do not accept revelation. All these points of support Mill dispensed with; while working upon the idea, so repugnant to the religious worshipper, of putting a logical limitation and restriction on the great object of worship. A Being that would not interfere to do us either harm or good can scarcely excite in us any strong regards; at least until we have undergone a new education. The supposed limitations of his power, besides being strangely at variance with the undeniable vastness and complex adjustment of the world, would seem fatal to his ascendancy in our minds.

The speculation is equally precarious as regards a future life. Mill hardly does justice to the natural difficulties of reproducing human existence, after death, for an eternal duration; and yet casts doubts on the omnipotence of the Power that is to perform the miracle.

A. Bain.

VI.—NOTES AND DISCUSSIONS.

DR. HUGHLINGS JACKSON ON MORBID AFFECTIONS OF SPEECH.

Dr. J. Hughlings Jackson, one of the Editors of *Brain*, has contributed to some recent numbers of that journal three important articles "On Affections of Speech from Disease of the Brain". His aim being always to illustrate abnormal conditions by a clear conception of the normal conditions of mental life, he is able by his familiarity with the best results of modern psychological analysis to exemplify in a singularly full and complete manner the close correlation between the two. This is seen, for example, in the prominence which he gives to the idea of cerebral disease as a process of Dissolution, the reverse of the process of Evolution as defined by Mr. Herbert Spencer. But the exigencies of pathological interpretation have also compelled him to go beyond accepted truths in psychology, and his papers contain some very suggestive ideas as to the nature of the normal mental processes.

In the first article (*Brain*, III.) he begins by remarking on the manifold character of Affections of Speech. Thus it is not enough to study speech "morphologically," that is, in reference to the geographical position of the centres concerned; it must be studied "anatomically," that is, in relation to the anatomical connexions between the centres and the parts of the body represented there. And so we must say that the substratum of words "is made up of nerve-cells and fibres representing some particular articulatory movement". Again, the method must not be partly anatomical and physiological, partly psychological, but the phenomenon must be consistently viewed on both the objective and the subjective side. Once more, these special cases of nervous disorder cannot be dealt with methodically apart from other kinds of nervous disease. Loss of speech must be studied in the light of the facts of loss of images or "impereception" (in delirium). Aphasia has also its analogue in hemiplegia, since in both we can trace degrees of dissolution, that is of reduction of actions from the least to the most highly organised. As our subject has to be studied empirically at first, we must adopt rough classifications. First of all loss of *speech*, due to extensive disease of the brain, must be distinguished from loss of *articulation*, due to complete paralysis of the tongue, &c., and from loss of *vocalisation*, due to disease of the larynx. Again we must draw a distinction between Intellectual and Emotional Language, and say that while the speechless patient has lost the former he has not lost the latter. That is to say, the patient may be able to use words (*e.g.*, "yes" and "no") interjectionally, but not propositionally. The affections of speech are very different in degree and kind according to the exact seat and extent of the disease. We may roughly mark off three degrees; (1) *Defect of Speech*, in which the patient has a full vocabulary, but confuses words; (2) *Loss of Speech*, in which the patient is practically speechless and his panto-

mimic is impaired; and (3) *Loss of Language*, in which, besides being speechless, he has altogether lost pantomimic, and emotional language is deeply involved.

We begin with (2), "complete aphasia," as the simplest. In noting this condition we must (as in the case of all nervous disorders) carefully observe both the patient's negative and positive condition—that is, what he has lost in language as well as what he retains. First of all, then, his negative condition is summed up by saying: (*a*)—He does not speak, that is, utter anything of real speech value. (*b*) He cannot write. This last defect shows he cannot speak internally (a fainter degree of external utterance). (*c*) He cannot read to himself (in most cases). (*d*) Lastly, his power of making signs ("pantomimic propositionising") is impaired. His positive condition is described as follows:—(*a*) He can understand what is said or read to him, showing that though "speechless" he is not "wordless". (*b*) His articulatory organs move well in eating, &c. (*c*) His vocal organs, too, act apparently well (he may be able to sing). (*d*) His emotional language is apparently unaffected. Thus he smiles, frowns, and varies his voice properly. This condition is only to be understood by a reference to the fact that the patient possesses the images symbolised by words. The patient's perception and recognition of things is unaffected Thus he will point to familiar objects which are named in his hearing: he recognises drawings, and even handwriting, though he cannot read what is written. So, again, he can copy writing, and copy print into writing, though unable to write in the sense of expressing himself. This shows that he has not lost images, and has not wholly lost words, though he has lost "the words used in speech". That is to say, he retains an "automatic service of words". Besides the comparatively unimportant distinction between internal and external speech (which is one of degree only), there is a very important distinction between "the prior, unconscious, subconscious, or automatic reproduction of words, and the sequent, conscious, and voluntary reproduction of words: the latter alone is speech either internal or external". This duality in the verbalising process corresponds to a duality in the revival of the images symbolised. Thus, when a man in delirium takes his nurse to be his wife, it is because in his sane state the first stage of his recognition of her as a woman would be the subconscious automatic reproduction of his, or one of his, well-organised symbol-images of woman, of which the one most organised would probably be that of his wife. There is evidence for saying generally that it is the right half of the brain which acts when the first subconscious service of words begins, the left when there follows that verbal action which is speech. The activity of the right half is also supposed to be that which underlies the understanding of another's words. The writer concludes this article by commenting on "emotional aphasia," which he regards as no real loss of speech at all.

In the second article (*Brain*, VI.) Dr. H. Jackson goes more into the details of the positive side of the case called by him Loss of

Speech. He admits that there is something like speech left, but contends that this is of the very lowest, most completely organised kind. The utterances made by the patient are either (1) *Recurring Utterances*, or (2) *Occasional Utterances.*

(1) *Recurring Utterances* consist (*a*) sometimes of jargon as "yabby," "watty" &c.; (*b*) in other cases they are made up of words which to a healthy person are speech, as "man," "awful"; but since they come out at all times, they mean no more than the jargon. Their only function is that of emotional expression. In truth, the patient sings his recurring utterances. (*c*) Sometimes, again, the recurring utterance is a phrase as "come on," which, though it has a propositional structure, has no propositional function in the mouth of a speechless patient. (*d*) A common relic of speech with the speechless patient is a recurring "yes" or "no," or both these words. Sometimes this is all that is left; at other times it is found along with utterances taken from the other divisions. The peculiarity of "yes" and "no" is that while they may be propositions (being "proposition-words"), they are not always this. Thus some patients may simply use "yes" and "no" interjectionally as an expression of feeling without meaning assent or dissent. Others again may reply by help of these "proposition-words," showing that they are not absolutely speechless. And, finally, in many cases, besides having the emotional service of these words, and being able to reply with them, the patient can say "yes" or "no" when told to do so, thus showing that he has the full use of them. The presence of this additional power of reproducing the words "yes" and "no" when told, marks an important distinction in speech-affections. To sum up the result of the inquiry into Recurring Utterances, the only real exception to the rule that the speechless patient has absolutely lost speech, is the case in which "yes" and "no" are used in reply (propositionally); and this exception is very significant, since these words are "the two most general, most automatic of all his propositions". "Yes" and "no" really stand on the border-line between emotional and intellectual language, being used by healthy people now in the one way now in the other. (Thus "yes" may simply express a feeling of sympathy as well as imply assent to a proposition, and "no" may indicate mere surprise.) Hence the retention of these two most perfectly organised of all propositions is strictly in accordance with the principle of Dissolution.

(2) *Occasional Utterances* are rare, with the exception of oaths, which are much more frequent. They may be classed serially as (*a*) Utterances which are not speech; (*b*) Utterances which are inferior speech; and (*c*) Utterances which are real speech. Under (*a*) fall "bad language" ejaculations as "Bless my life," which are brought out under some strong excitement and cannot be repeated. They are among the best organised emotional ejaculations. Class (*b*) includes such utterances as "Wo, wo!" once brought out by a patient when standing by a horse. They are true speech, but inferior speech ("superior" and "inferior" as applied to speech referring to the

degree of precision of application to new relations of things). That is to say, they are well-organised utterances prompted by special but often-recurring circumstances, and admitting of no variation in correspondence with new situations. Group (*c*) comprises very rare utterances which are perfect speech, being adaptations of words to special and new circumstances. Thus one of Dr. Jackson's own patients said in reply to an inquiry by his son as to where the former's tools were, "Master's," which involved adaptation to new circumstances. Such a case presents great difficulties. It is impossible to say whether the reproduction of this proposition was owing to the frequency of its repetition before the disease came on, or to the strong emotional interest excited by the question. (The man was very poor, and his tools a matter of real importance to him.) Neglecting these very rare utterances, we see that a speechless patient may possess some "rags and tatters" of real speech, which represent the best-organised part of his language. It is probable that this residual highly organised utterance takes place by help of the right half of the brain, that part which appears to serve in the first automatic reproduction of words. It is to be supposed that while every process of verbalising, like every other process, is dual, the more automatic the process is the more fully and equally is it represented in each half of the brain.

It still remains, however, to account for the use of those Recurring Utterances which do not at first appear to be the result of such highly organised nervous arrangements. In the third article (*Brain*, VII.) Dr. H. Jackson takes up these cases, giving fuller examples of Recurring Utterances. When the recurring phrases, which, as observed, are always used emotionally, are not common exclamations, like oaths, we may account for their recurrence by the hypothesis that "*they were being said, or about to be said, when the patient was taken ill.*" To make this intelligible it is needful to enlarge more fully on the distinction already pointed out between the two services of words, Subconscious or Automatic and Conscious, connected with the two sides of the brain. Speech is to be regarded as but the second half of a whole process which may be called *verbalising*. We can say that it includes two propositions, a "subject-proposition," followed by an "object-proposition". "It is supposed that the subject-proposition is the 'survival of the fittest' words in fittest relation during activity beginning in the right half of the brain," and that it "symbolises an internal relation of two images, internal in the sense that each of them is related to all other images already organised in us". On the other hand, "the object-proposition symbolises relation of these two images as for things in the environment, each of which images is related to all other images then organising from the environment". Thus "the two propositions together symbolise an internal relation of images in relation to an external relation of images". Dr. H. Jackson bases this distinction on Mr. Spencer's definition of a psychological proposition as compounded of two propositions (*Psychology* I., p. 162). We have to suppose, then, that the words of the recurring

utterance constituted the last subject-proposition (not completed to an object-proposition) when the patient was taken ill. In some cases it is possible to support this hypothesis by a reference to the facts. Thus the recurring utterance of a railway signalman taken ill on the rails was "Come on to me," or simply "Come on," and the pathetic utterance of a clerk who lost speech and became paralysed after hard work in making a catalogue was "List complete". If this hypothesis be correct, such utterances stand at the opposite extreme to that of old and perfectly organised utterances. They correspond to the latest and newest nervous actions. We have to suppose that in the healthy man there remains after every last utterance for a short time a slight degree of independent organisation of the nervous arrangements concerned; for without assuming this we cannot understand how it is possible to recollect what has just been said, and so to speak consecutively. In the case of the speechless man we must suppose that this normally temporary activity of nervous arrangements becomes permanent. There are strong reasons for saying that these recurring utterances are due to the activity of the right half of the brain. The left half is known to be extremely damaged. To say that the disease caused the utterances is absurd, for disease is simply a process of destruction. The positive mental symptoms arise during activity of lower centres or lower nervous arrangements which have escaped injury. Why they should arise after the injury is probably to be explained by the supposition that "destruction of function of a higher centre is a removal of inhibition over a lower centre". We must say, then, that while disease *causes* loss of speech, it *permits* the increased dischargeability of the right half of the brain. This increase of excitability on the removal of inhibition is commonly considered to be only temporary, but the particular activity may be kept up by repeated use; and this accounts for the recurrence of the utterance. In the case where there was no recurring utterance besides the deeply organised "yes" or "no," we have to suppose that when the patient was taken ill there was no subject-proposition "organising". And so there was nothing to interfere with the simple course of dissolution—namely, "reduction to the most automatic of all propositions". What applies to recurring utterances of propositional form probably applies also to jargon, which may be viewed as "made up of fragments of the words or phrases the patient was about to utter when taken ill". Thus it may be conjectured that the woman whose recurring utterance was "me," "pittymy," or "committymy," &c., was saying when taken ill, "Pity me, come pity me". This mixing up of words is illustrated by a reference to what takes place in slighter cases of aphasia, and even in a normal condition, as the utterance by a healthy man of "mukes from Boodies" for "books from Mudie's". These troubles of speech are probably due to hurried activity of the right half of the brain, involving a conflict of strong and sudden nervous discharges, during a state of emotional excitement. Such emotional excitement would naturally arise during the setting-in of the illness; hence the frequency of confused speech or jargon among forms of recurring

utterances. A similar line of remark applies to those recurring utterances which are clearly emotional, and consist of interjectional expressions as "fire!" "help!" We may suppose that in these cases the process of dissolution effected by the disease was so rapid and so deep that only the most organised utterance had a chance of surviving. "To recapitulate: By considering (1) the external circumstances at the time of the being taken ill; (2) the intensity of the emotional state under which the last attempt at speech was made; and (3) the gravity of the lesion, we may perhaps be able to show why this or that kind of recurring utterance remains in particular cases of speechlessness."

We now pass from the second kind of aphasia, Loss of Speech, to the first kind, Defect of Speech. Here the patient may be able to get out a word or even a reply as "very well," and go on uttering it in rejoinder to further questions to which it is irrelevant, being aware of its irrelevance. It becomes, in fact, a temporary recurring utterance. This "barrel-organism" (to use a phrase of Gardiner) shows itself also in writing. It seems doubtful whether the patient is able to repeat what he has said when he is told to do so. We must distinguish between the ability to say something for the sake of saying it and the ability to speak. The inability of the patient to say "no" when told to do so is of the same order as his inability to protrude the tongue when told to do so. Hence, it will be well to consider this feature of aphasia in connexion with other losses of voluntary power in disease. To understand these we must revert to the hypothesis of the duality of mental action, applying this now to the process ending in voluntary action instead of to that ending in perception or ideation. In voluntary operations we suppose there is a preconception; the operation is nascently done or "dreamt" before it is actually done. Thus, before I put out my arm I must have a "dream" of the hand as being already put out. To "will," to "know," to "intend," to "try," to "remember," are all names for this subjective reproduction which precedes objective reproduction. In the case of voluntary action the subjective order of the "dream" is the opposite to that of the actual operation; thus the image of the final stage of the movement, or rather its result, must precede the representation of the intermediate stages. And it is probable that subjective states always arise in an order the opposite to that of corresponding objective states. It is pretty certain that this is so in some dreams where a noise develops a dream, though the consciousness of it may come last in the dream it excites. So it is supposable that when we say "gold is yellow," the subjective order may be "yellow," "gold," "for our concern is first with the yellowness of gold, not with gold". In the case of automatic actions, too, there is probably a "dream," though here the movement has so often followed the "dream" that the two are nearly equally perfect and easy. Now, when the patient tries to put out his tongue, or to say "no" when told, and fails, we have to suppose that the subjective reproduction or

"dream" takes place without the second stage of objective reproduction.

Dr. H. Jackson concludes this paper by touching on other kinds of nervous affection which show something analogous to permanent "barrel-organism" (recurring utterances) of speechless patients. In these cases where temporary unconsciousness results from some injury, we find that operations going on when the unconsciousness supervened remained nascent during the period of total unconsciousness, and became active again during the restoration to consciousness, at the end of which stage they ceased. Such restoration means the return of control from higher centres, which is impossible in the case of "speechless" patients in whom the higher centres are destroyed.

JAMES SULLY.

KANT'S REFUTATION OF IDEALISM.

Professor Caird's answer, in the last No. of MIND, to my note in the preceding No., will at any rate be useful in preventing that confusion between his own doctrine and Kant's which his previous note seemed to me likely to cause. But on the historical point which I was further concerned to establish I have unhappily failed to make my argument plain to Mr. Caird; at least I cannot perceive that he has seriously attempted to meet it. Fortunately the amount of agreement between us—as I infer from his language and his silence taken together—is so considerable that I ought to be able to explain quite clearly the exact nature of our disagreement; which I may then leave to the judgment of the reader.

To prevent any necessity of referring to previous Nos. of MIND, I will begin by stating the points on which (as I understand) we are agreed.

(1) We agree in holding that, as soon as Kant became aware that Idealism had been imputed to him, on account of the doctrine expounded in the First Edition of the *Kritik*, he was seriously concerned to repel the imputation; not in consequence of any change of opinion, or any desire to conceal his real view, but because he honestly did not regard himself as an Idealist, and therefore did not wish to be so regarded.

(2) We agree in recognising that, in this attitude of mind, two different lines of reply to the charge of Idealism would naturally present themselves to him.

In the first place, he might say:—"I am not an Idealist, because I acknowledge the real existence of things-in-themselves, independent of our consciousness. I maintain, no doubt, that the manner of this existence is altogether unknown to us; but that has nothing to do with the question of its reality. And though I have called my doctrine Transcendental Idealism, that is no reason for confounding it with Idealism in the ordinary acceptation of the term; for the latter has been always understood to relate to the *existence* of material

things, whereas my so-called Idealism only relates to the notions (*Vorstellungen*) of them that we derive from their impressions on our senses." This I will call the Realistic answer.

The second, which I may call the Transcendental, answer, I will give, to avoid dispute, in Professor Caird's own words. Kant might say :—"I am not an Idealist, because I insist that we do know things out of ourselves; *i.e.*, things that are different from that series of inward states which constitutes the empirical self. The main aim of my Transcendental Deduction is to show that we are conscious of objects, and of a world of objects, not through mere sense, but only in so far as the one self manifests itself as a synthetic principle, which binds together the manifold of sense by means of the Categories. But the complementary truth is, that we are conscious of the permanent unity of the self in the succession of its feelings or conscious states, only in distinction from, and in relation to, a world of objects so determined."

(3) We agree in regarding these two answers as essentially distinct. Mr. Caird, as I understand, accepts the Transcendental answer as sound; while he considers it due to the "incompleteness" of Kant's system that he makes the Realistic answer at all.

(4) We agree in holding that, in one of the two main passages in which Kant replied to the charge of Idealism, the Realistic answer is undoubtedly given, *viz.*, in the *Prolegomena zu einer jeden künftigen Metaphysik* (§. 13, Anm. ii., iii.); while, on the other hand, the Transcendental answer is undoubtedly given in the 'Refutation of Idealism,' inserted in the Second Edition of the *Kritik*. Mr. Caird does not dispute the former of these propositions; and I certainly had no intention of disputing the latter.

The question on which we disagree is whether Kant himself distinguished the two answers as Mr. Caird and I agree in distinguishing them. I hold that he did not; and the ground I gave for holding this was not—as Mr. Caird seems to have understood—the language used in the 'Refutation' considered merely by itself, but a comparison of this with the language used in the corresponding passage in the *Prolegomena*. For the convenience of the reader I will place side by side the most important portions of the two passages; only adding that I think the case will appear even stronger to any one who compares the two contexts :—

Ich bin meines Daseyns als in der Zeit bestimmt bewusst. Alle Zeitbestimmung setzt etwas Beharrliches in der Wahrnehmung voraus. Dieses Beharrliche aber kann nicht etwas *in mir* sein; weil eben mein Daseyn in der Zeit durch dieses Beharrliche allererst bestimmt werden kann. Also ist die Wahrnehmung dieses Beharrlichen nur durch *ein Ding ausser mir*

Ich dagegen sage: es sind uns *Dinge als ausser uns befindlichen Gegenstände unserer Sinne* gegeben, allein von dem, was sie an sich selbst sein mögen, wissen wir nichts, sondern kennen nur ihre Erscheinungen, d. i., die Vorstellungen, die sie in uns wirken, indem sie unsere Sinne afficiren. Demnach gestehe ich allerdings, dass *es ausser uns Körper* gebe, d. i., Dinge, die,

möglich. Folglich ist die Bestimmung meines Daseyns in der Zeit nur *durch die Existenz wirklicher Dinge, die ich ausser mir* wahrnehme, möglich. Nun ist das Bewusstsein in der Zeit mit dem Bewusstsein der Möglichkeit dieser Zeitbestimmung nothwendig verbunden; also ist es auch mit der *Existenz der Dinge ausser mir*, als Bedingung der Zeitbestimmung, nothwendig verbunden; d. i., das Bewusstseyn meines eignen Daseyns ist zugleich ein unmittelbares Bewusstseyn des Daseyns *anderer Dinge ausser mir.*—(*Kritik der reinen Vernunft*, 'Elementarlehre,' II. Th., 1 Abth. ii. Buch, 2 Hauptst., 3 Abschn.)

obzwar nach dem, was sie an sich selbst sein mögen, uns gänzlich unbekannt, wir durch die Vorstellungen kennen, welche ihr Einfluss auf unsre Sinnlichkeit uns verschafft, und denen wir die Benennung eines Körpers geben, welches Wort also bloss die Erscheinung jenes uns *unbekannten, aber nichts desto weniger wirklichen Gegenstandes bedeutet.*—(*Prolegomena zu einer jeden künftigen Metaphysik*, § 13, Anm. ii.)

I have italicised certain words in each passage, in order to show the complete identity of the cardinal terms used ("wirkliche Dinge ausser mir" or "ausser uns"). These, according to Mr. Caird's view, Kant must have consciously used in entirely different meanings in the two passages.

Now it seems to me in itself very strange that Kant should consciously adopt two essentially distinct modes of purging himself from the charge of Idealism, should put forward each separately in one of the two chief passages in which he expressly deals with the question, and yet should nowhere point out to the reader the fundamental difference between his two lines of reply. But, granting that he might have adopted this strange procedure, I maintain that it is more than strange—that it is simply incredible—that he should in the two replies have used the same cardinal terms in different senses, with a perfect consciousness of their equivocality and yet without giving a hint of it to the reader. This is the point to which I wished to direct attention in my former note; and to which—so far as I can see—Mr. Caird's remarks do not even suggest an answer.

But further I cannot understand how, without some such confusion of thought as that which I attribute to him, Kant could ever have regarded his Transcendental answer as a 'Refutation' of the problematical Idealism of Descartes. For when we conceive this answer with the distinctness with which Mr. Caird and I agree in conceiving it, it must be obvious that, as addressed to the Cartesian position, it involves a plain *ignoratio elenchi*. Descartes says: "I maintain what you call a 'problematical' Idealism; that is, I have in my mind the notion of a material world, substantially distinct from mind, but I have no clear and certain intuition that such a non-mental world actually exists; while I have a clear and certain intuition that I, as a Mind, actually am. I know that Matter *may* exist independently of mind; but that it does so exist requires proof." Kant answers: "I will supply the proof. What you call Matter is doubtless in its

elements mental: indeed, I show you exactly how it is constructed by the synthetic action of your thinking self out of your passive feelings: but I show too that you are necessitated to think of it as something distinct from your individual mind." Will not Descartes rejoin: "It will take a good deal of argument to make me accept this perplexing and self-contradictory position. But supposing I accepted it, I should regard myself as a 'dogmatic' and no longer 'problematical' Idealist; for in spite of this invincible necessity of conceiving matter as distinct from my mind, I should, as you say, philosophically know it to be something made by mind out of mental elements. Call you this refuting Idealism? I call it confirming Idealism."

And surely Professor Caird must so call it; otherwise why does he wish to fix on Kantism, as he interprets it, this designation so vehemently repudiated by its author?

I conclude therefore that Kant, when making his Transcendental reply to the charge of Idealism in the Second Edition of the *Kritik*, did *not* clearly separate it from the Realistic answer to the same charge which he had already given in the *Prolegomena*: so that in the former passage the phenomenal matter, whose permanence he regards as a necessary postulate of empirical thought, must be taken as carrying with it in unsevered connexion the "matter in itself," whose independent existence it "never entered his head to doubt". Nor do I think that any one who knows the *Kritik* will regard the fact, that Kant elsewhere clearly distinguishes his phenomenal from his noumenal object, as presenting any very serious obstacle to the adoption of my view.

One word more on the question of nomenclature. I quite agree with Mr. Caird that there are objections against the application of the term 'Idealism' to Berkeley's system; but I think it would only make confusion worse to call it (as he proposes) 'Sensationalism'; on account of the materialistic associations which are now firmly attached to the latter term. I should myself prefer to call it 'Mentalism'; and I have, in fact, made a mild effort to bring this term into use—but, so far as I know, without success.

HENRY SIDGWICK.

P.S.—Since the above was written, I have discovered that Professor Adamson has taken my previous Note as the occasion of an Appendix (I.) in his recently published book *On the Philosophy of Kant*. Mr. Adamson, however, steers clear of the point of my argument even more completely than Mr. Caird, as he does not even allude to the passage in the *Prolegomena*. Hence the sole answer that I have to make to him at present is to draw his attention again to this passage. I do not see how, with these *Anmerkungen* ii. and iii. to § 13 before him, he can maintain that "the distinction between a thing and the representation or notion of thing" has "*never*," in Kant's writings, "any reference to the question of Noumena".—H. S.

I do not wish, any more than Mr. Sidgwick, to prolong a controversy, from which the vital point has been almost extracted ; but I understand Mr. Sidgwick still to maintain that, in the "Refutation of Idealism," Kant, while proving at best only that external experience is as real as internal experience, supposed himself to be proving also the reality of things-in-themselves as opposed to phenomena. This Mr. Sidgwick maintained (1) on the ground of the language of the passage in the *Prolegomena;* and (2) because he thinks, that, on any other supposition, Kant's argument against Descartes would involve a palpable *ignoratio elenchi.*

On the first of these points I answer that, in the passage in the *Prolegomena*, all that Kant says is that it is his doctrine that bodies, or "things given to us as objects of sense without us," have an existence in themselves, the nature of which we cannot know. In other words, external things are phenomenal of an unknown noumenon. I cannot see that this statement in any way authorises us to conclude that, in a passage written in quite a different connexion, in which Kant expressly and repeatedly declares that he is seeking to prove only that external experience is as real in its object as internal experience, he yet confused this proof with a demonstration of the reality of things-in-themselves. How could Kant, for a moment, suppose, that the permanent in time, which is known under the Category of Substance, is the thing-in-itself? It should not be forgotten that the two senses of the words, "*ausser uns*," are distinguished in a passage of the *Critique* (p. 200) which refers directly to the subject treated of in the "Refutation of Idealism".

Mr. Sidgwick further argues, that, without a confusion of the external object with the thing-in-itself, Kant's argument against Descartes must have been seen by himself to be an *ignoratio elenchi.* Descartes, however, according to Kant's view of him, had maintained that all we know immediately is our own inner experience ; and that matter (not merely things-in-themselves, but extended substance or things in space) is known only by inference, as the cause of some of our inner experiences. And Kant's answer is, that external experience cannot be less immediate than internal experience, seeing the latter presupposes the former. That Descartes mistook matter for a thing-in-itself is, in fact, just Kant's charge against him : it is what Kant means when he says, that transcendental realism necessarily leads to empirical idealism. "It is the transcendental realist who is inevitably led afterwards to play the part of an empirical idealist ; for, as in the former character, he has presupposed of the objects of sense that, if they are external, they must have their existence in themselves, apart from sense, he is obliged from this point of view to hold that none of the representations of our sense are able to assure us of their reality" (p. 296). In other words, he who takes the externality of matter to mean that it is a thing-in-itself, and not an object of sensible experience, must inevitably be led to the conclusion that its existence is problematical, as being reached only by inference.

That Kant had two ways of opposing Idealism, was an inevitable result of his twofold distinction between phenomena and noumena and between the object of internal and of external experience. I may add that in the passage in the *Prolegomena* there is no argument, but only the assertion of his own belief in the existence of things-in-themselves. The proof of that existence is given elsewhere in the *Critique of Practical Reason.*

EDWARD CAIRD.

DR. WARD ON FREE-WILL.

In a series of metaphysical discussions contributed, since 1871, to the *Dublin Review*, Dr. Ward has laid particular stress on three topics as more especially involved in the philosophical foundations of Theism. These are Innate Conscience, Necessary Truth, and Free-will. His later papers have reference chiefly to the last-named topic —Free-will, which he has expounded at considerable length, in accordance with his own views; and, in so doing, he has combated the arguments on the other side. In this polemic he has largely involved both John Mill and myself. I replied to some of his criticisms in the present edition of *The Emotions and the Will*, and to this reply he has now made a rejoinder (*Dublin Review* for April, 1879, with supplementary paper in October).

Neglecting the minor objections brought by Dr. Ward against the language that I employed in remarking upon his earlier article in April, 1874, I wish to summarise his positions, as well as I am able, and to consider their bearing upon the controverted points.

I have on every opportunity protested against the use of the leading term "Freedom" as applicable to the Will, or as suitable to express the sequence of motive and act in our mental activity. I see no chance of a reconciliation of the opposing views until this term is abandoned, and the question stated in other phraseology, such as I have repeatedly exemplified. Not only in the leading term, but in many of the subordinate expressions, do I consider that there is an unsuitability that contributes to the entanglement. I remarked upon some of these in a Critical Notice in MIND III., p. 393, to which I feel scarcely able to add anything new.

When Free-will meant that actions could arise without any motive, or definite mental antecedent, the issue was tolerably clear; and the polemic of the necessitarians was directed accordingly. The subtlety and penetration of Hobbes led off the fight. Then came Locke, who was the first to comment upon the impropriety of the word "Freedom". But most exhaustive of all is the work of Jonathan Edwards, which, as a powerful advocacy of Necessity in the interest of Theism, might, I think, have received some notice from Dr. Ward. Even Mill, in the *Examination of Hamilton*, considered that "uncaused volition" was the thesis that he had to refute.

Now, however, there is a change of front among the Free-will advocates. They object to being charged with maintaining uncaused volition. For example, Dr. Calderwood, in his *Handbook of Moral Philosophy*, says—"Whatever be the nature of the problem, it certainly does not stand thus:—Is a volition an uncaused event? Are there any facts in consciousness which cannot be attributed to any cause?" In like manner Mr. Alexander, in his very acute polemic with Mill, disclaims the abrogation of the law of cause and effect in human actions. Reid had affirmed very bluntly that acts are often done without any motive.[1]

[1] "I do many trifling actions every day, in which, upon the most careful

My chief business at present, however, is with Dr. Ward, who has bestowed more attention upon the controversy than any one that I am acquainted with. I shall commence with endeavouring to set forth his positions as fully and as accurately as I am able to do in a short compass. Although I have read all his articles on the subject, I will not undertake, in my references, to go beyond those of the year just concluded; taking for granted that he has embodied in these whatever he considers important in the exposition and advocacy of Free-will.

My difficulty in arguing the question has always consisted in grasping clearly what Free-will means. I wish the doctrine to be translated into some other terms such as we cannot possibly misapprehend. It is a great convenience, so far, when the phenomenon is represented as an exception to the uniformity of nature. Uniformity is an intelligible fact; and to deny it seems equally intelligible. Yet as every denial supposes something positive, we should like to know a little more about the class of actions that are emancipated from the rule of uniformity. Whether do they begin from absolute nothing; or do they possess antecedents, but shift about from the one to the other, so that from the occurrence of a given antecedent we cannot conclude what the consequent is to be? We should like also to have the region of failure of uniformity closely circumscribed. Where there is no uniformity there is clearly no rational guidance, no prudential forethought.

I come now to Dr. Ward's mode of representing the doctrine of Free-will, and of establishing it from our mental experience. It consists in what he terms "anti-impulsive effort," or what is spoken of more familiarly as "self-control" or "self-restraint". This, of course, is no new phenomenon in human experience; it is spoken of in every account of the constitution of the mind. The novelty lies in treating it as a sure and unequivocal argument for Free-will, considered as an exception to the ordinary law of causation or the uniformity of nature.

That we may understand Dr. Ward's position thoroughly, let me quote, first, his other ways of putting it, and next, some of his characteristic examples. The question is, he says, "Do I, or do I not, at various times act in resistance to my strongest present desire?" The Determinists say "the will is infallibly determined by what they call the strongest motive"; Dr. Ward holds that the strongest motive may be overborne by the will's spontaneous impulse. The Determinists hold, he says, that conduct follows the balance of pleasure and pain; Libertarians believe in a power exercised in the

reflection, I am conscious of no motive." "If a man could not act without a motive, he would have no power at all; for motives are not in our power." (Hamilton's Edition of *Reid*, p. 609.) As to the first remark, I presume Reid refers to the things that we do in a half-conscious mechanical way. Yet, whether or not a motive, in the ordinary sense, be traceable, an antecedent situation is traceable, which arising, the action regularly follows. The second sentence is a manifest confusion of ideas, which Hamilton effectively exposes.

direction of pursuing virtue in opposition to the solicitations of pleasure. The self-restraining exercise of Free-will is put forth with immeasurably greater frequency in the direction of virtue than in that of pleasure. Yet all men—good, middling, and bad alike—are equally free. The Determinist's theory is that no man resists his strongest present impulse; and his theory is refuted if it be shown that a large class of men do often resist their strongest present impulse.

I will now present some of Dr. Ward's examples. "I am walking for health's sake in my grounds on a bitterly cold day. My strongest present desire is to be back comfortably in the warm house; but I persistently refuse to gratify that desire; remembering the great importance of a good walk, not only for my general health, but for my evening's comfort and my night's sleep." Again:—"A is called very early on the 1st of September, and he feels a real 'desire' to sleep off again; nevertheless, his wish to be early among the partridges is a stronger, more influential, more keenly felt, more stimulating desire." Accordingly, "his 'preponderating spontaneous impulse' is to get up at once." "But B, who is no sportsman, has also ordered himself to be called early the same morning, for a very different reason. He will be busy in the middle of the day, and he has resolved to rise betimes, that he may visit a sick dependent. When he is called, his strongest present desire is to sleep off again; but he exerts himself; he puts forth manly self-restraint, and forces himself to rise, though it be but laboriously and against the grain. A starts from bed by a spontaneous and indeliberate impulse; but B resolves weakly and fails, until he at last succeeds by a still stronger and crowning resolve in launching himself on the sea of active life." "A *obeys* his strongest present desire, while B *resists* it."

Once more:—"A military officer—possessing real piety, and steadfastly purposing to grow therein—receives at the hand of a brother officer some stinging and, as the world would say, 'intolerable' insult. His nature flames forth; his preponderating spontaneous impulse—his strongest present desire—is to inflict some retaliation, which at least shall deliver him from the 'reproach' of cowardice. Nevertheless, it is his firm resolve, by God's grace, to comport himself Christianly. His *resolve* contends vigorously against his strongest present *desire*, and the latter is brought into harmony with his principles. What a sustained series of intense anti-impulsive effort is here exhibited!" "The two classes of effort mutually differ, not in degree, but in kind."

Such are Dr. Ward's examples of anti-impulsive effort which he identifies with Free-will. They are in themselves perfectly familiar to us all; and the only difference of opinion is as to the mode of rendering or interpreting them. Before entering upon this, however, I wish to complete the statement of Dr. Ward's positions by quoting his view of Causation, which is vital to the discussion. He protests against using the terms "free" and "uncaused" as synonymous; but he differs from Determinists in the meaning that he attaches to cause. In fact, he recognises two kinds of causes; one is cause, as

understood by Determinists, namely, the law of uniform phenomenal sequence. He gives the designations "prevenant" and "postvenant" to express cause and effect, in this sense; and "prevenance" to express causation as uniform sequence. He allows that the physical world, generally speaking, is ruled by this kind of causation, the important exception being miracles; and the moral or psychical world is also ruled by it, with the exception of the human will, which partly participates in it and partly follows another law. The causes of the material world, uniform in their action, are "blind" causes; and such causes are also at work in the mind. By these, "given certain psychical and corporeal antecedents, one definite group of psychical consequents infallibly and inevitably follows". But now we can imagine that there may be an "*originative*" intermediate cause. We can easily imagine that some substance shall not be determined by its superior cause with strict and inevitable necessity to one fixed effect; but, on the contrary, shall be permitted a certain latitude of choice. The very same substance may be necessitated to act as a "blind" cause in regard to one class of its effects, while nevertheless it can act as an "originative" cause in regard to another class; it being involved in the whole supposition, that the substance which acts as an originative cause must be an *intelligent* substance, such as is the human soul. While this case is clearly imaginable, no one, Dr. Ward thinks, has attempted to show that it is intrinsically impossible. Now the notion of freedom is included in the notion of an originative cause.

Dr. Ward does not think it necessary, in explaining Free-will, to introduce, as many Libertarians do, a reference to the human personality, or the "Ego"; and not finding this necessary, he does not think it desirable.

I will remark, first, on Dr. Ward's statement of the second kind of Causation—that wherein uniformity is not the rule. My difficulty is, and always has been, to reduce this position to a definite and intelligible statement. What uniformity is, we understand; its negation or qualification leaves us utterly at sea. There are two alternatives in the denial of uniformity, the one that events can arise from nothing, the other that the sequences of events may vary; the same antecedent situation being followed sometimes by one consequent and sometimes by another. Dr. Ward appears to repudiate the first alternative; he will not allow, so far as I understand him, that Free-will is the same as actions arising from nothing at all. Indeed, the expression—"originative intermediate cause," coming in to counter-work our present impulses and desires, means an antecedent adequate to the result.

The only position, then, as regards our voluntary actions, is, that there is not a strict invariability of sequence in those cases where we put forth a virtuous effort to resist our rash and passionate impulses. The same mental situation may recur; but the outcome may be different—for the better or for the worse. It is necessary to our dignity as moral agents that we should not decide always one way when the same case comes before us. Freedom of choice is illustrated

by our occasionally choosing the less good, like a bold fault in a correct poet.

When Free-will is stated in this form—and it clearly admits of being so stated—we cannot help being staggered by the assumption. Before considering the facts offered by way of proof, we may reflect a little upon the intrinsic difficulties of the statement itself.

It could not escape remark, how dependent we are, in all the affairs of life, on nature's uniformity. If we wish to secure an end, we look to what has happened in the past, and count upon that in the future. Our whole security in the matters of this world is based on the expectation that what is to be may be inferred from what has been; and this not merely in the region of brute matter, but equally so in the region of mental sequences. That there should be any part of the mind, owing to superior sanctity, exempted from the rule of uniformity, must make us very uneasy, until we can trace a circle round it, so as to hem it in and keep it clearly apart from the region where law prevails. We should be very much relieved to think that it was but a very small portion of our mental nature; and, if I may judge from my own feelings, we should be still more rejoiced to find that the whole supposition was a mistake. Of course, we can always make allowance for a margin of uncertainty; being obliged to do so, in many instances, not from the variability of the sequences, but from the impossibility of calculation.

Dr. Ward says that no philosopher, so far as he is aware, has attempted to show that the supposition of an originative cause, exempted from uniformity, is impossible. This much, however, we may say, that *uniformity is found to be the rule of nature in all cases sufficiently free from ambiguity to be admitted as evidence*. The more plain a fact becomes, the more certain is its testimony to the principle of uniformity. Look at the grand case of gravitation, on which all Astronomy and all Navigation are suspended. There was a time when people might have advanced a doctrine of variability of sequence in celestial phenomena, being sheltered by the imperfection of the then knowledge of the facts. Look at the atomic theory in Chemistry. Look at the doctrine of Life springing from Life. All the clearly ascertained facts point one way; while the facts not clearly ascertained are those alone that give any colour to the supposition of variability of sequence. Now, I humbly submit that, in such a situation, the Ayes have it. The clear facts are unanimous; the obscure facts are at best ambiguous; and an ambiguous testimony can never be set against one that is unambiguous. A hundred clear instances one way cannot have their force impaired by five hundred uncertain instances.

If there be exceptions to the uniformity of nature, they ought ere now to have come to view in some unmistakable cases. A doctrine that can be maintained only in the regions of clouds and darkness, is not competent to establish a negative to another doctrine that is more and more confirmed as we can bring the phenomena into the light of day.

This brings me to Dr. Ward's examples whereby he thinks he can prove that the ordinary law of uniformity does not apply to human actions throughout. Freedom is typified, according to him, by the mind's resistance to the solicitation of present impulses. Now, as I have endeavoured to analyse this situation in the series of chapters that I have devoted to the explanation of the Will, I can do little more than repeat myself in saying that the mind's anti-impulsive efforts are due to the stored-up recollections of the past, and are no more exempted from the law of uniformity than the impulses of the present are so exempted. Take Dr. Ward's instance of walking in a cold wind to avoid sleeplessness and other discomfort. I can say, on this, merely that the recollection of former occasions of discomfort from being too much indoors is a motive power to withstand the urgency of the present discomfort of cold. It is a fact or law of the human mind, constituting what I believe to be the psychological explanation of prudence, that the remembrance of pain is an inducement to avoid re-incurring it; the power of the inducement being in proportion to the vividness of the representation of the past; and this again depending upon repetition and other circumstances that I have endeavoured to specify. When a strong present impulse arises such as to urge us in the direction of the dreaded evil, two powers are in conflict; each having a certain impetus, and the result shows their relative force. Often the present impulse carries the day at once; at other times, there is an even and protracted conflict, which usually consists of a swaying to and fro, owing to the vacillation in the representative power. If, in this nearly balanced situation, the throw is given for prudence at last, we are said to have maintained a fierce struggle, and to have made a great effort for the right. There is no effort when the representation of the past has attained the pitch that time and repetition often brings it to; the virtuous resolution is taken with ease; it is anti-impulsive without effort; it exercises control not by freedom of the will, but by the psychological law of the stronger. He that has had few experiences of catarrhs or of rheumatism from catching cold gives way to his impulses to go fishing, or shooting, or boating in the wet. The accumulation of the painful experiences, the augmentation of their severity and persistence, becomes a power sufficient to arrest the impulses to sport. There is a growing efficacy in such resistance. Beginning in the day of small things when the impulse always conquers, the representation of the pains rises to the point of an equal struggle, when the mind is torn and tossed about for a length of time, showing the anti-impulsiveness in its most painfully conscious form, the form where effort is typically present. A few more additions to the ideal growth, or, it may be, a subsidence of the eagerness for sport (which equally comes by the operation of a psychological uniformity), renders the conquest rapid and sure, and the accompanying consciousness of struggle and effort is less and less. The temperate old man lets the wine-bottle pass again and again without the slightest pang; his so-called liberty of the will is a glorified uniformity of easy resistance to alcoholic temptation.

It is quite true that at the same stage of representative growths of past good and evil, we may not always decide in the same way, even with an equal present impulse. In the wide compass of human motives there are numerous agencies to concur or conflict with the virtuous resolve, and these may not always be evoked. It is part of the operation of circumstances to bring up or to exclude emotional influences and recollections; our prudence, as depending on personal experience, would be greatly augmented by the concurring view of some other victim to the mischief that we are tempted to incur. But such variations have nothing to do with lawlessness, or the breach of uniformity of sequence, in human actions; we can state them to ourselves as the proper and regular course of natural law under the several circumstances.

What I have now stated is but a poor epitome of the detailed explanation of motives in my discussion of the Will. I do not ask Dr. Ward to accept the explanation as in all respects satisfactory and complete. My present argument merely requires that there should be a possible alternative to the supposition that the Will is not subject to the rule of uniformity. So long as there is no unequivocal instance on his side such an explanation deserves to be listened to. It now remains to consider still more closely his instances of anti-impulsive effort, with a view to see how far the exclusion of law or uniformity in the usual sense is thoroughly carried out.

The following is a very remarkable statement:—"We need hardly say that, in our view, devout Theists are immeasurably the most virtuous class of human beings. Consequently, in our view, devout Theists will, with absolute certainty, immeasurably exceed other men in their anti-impulsive efforts; for the simple reason that they immeasurably exceed other men in the vigilant care with which they adjust their volitions with a standard which they consider supremely authoritative."

I call attention to this statement as being, to my mind, an admission that virtuous anti-impulsive efforts *follow certain conditions*, or arise under a certain definite set of circumstances, in whose absence they would not arise. It is, to all intents, a Determinist account of the source of virtuous actions. Given devout Theism, anti-impulsive efforts on the side of virtue follow by a law of human nature. An agent is assigned adequate to an effect. Where is the room for freedom or for any "originative" intermediate cause? The devout Theism is the cause. Any other cause would be either an addition to the force of this cause, or a diversion for the worse. But any addition made to the regular effect of devout Theism may be taken *as part* of that agency; it need not be separately viewed unless it follows an independent course; while such independence would only throw the result into uncertainty; the devout Theism would no longer work out its proper result.

If it be said, as Dr. Ward maintains, that the agent is still free, I can only ask, What does the freedom amount to? The end of all is to make a man perform virtuous acts. If, to illustrate his freedom, he

deviates from this course, what is the gain? and if, in a definite situation tending to virtue, the agent acts virtuously, this is merely a form of Determinism. Why should the devout Theist be ashamed or affronted at being described as following the "law of his being"?

Dr. Ward remarks that the Phenomenist is compelled by his philosophical theory (if he be consistent) to be proof against any amount of testimony which may be adduced for the fact of freedom, viewed as an interruption of the order of cause and effect. But most of us embrace phenomenism because we have never had such testimony presented to us. Dr. Ward justly describes the exception as of the nature of a miracle; now, he will allow that, being so, it demands very clear facts to prove it. What interest can any one have to hush up such an extraordinary circumstance; or how could one possibly hush it up if every man carries about in his own mind the evidence for it?

Thus the standing difficulty in Dr. Ward's whole argument is that he mixes up freedom with other agencies that, for aught we can see, might of themselves produce the whole effect. He cannot isolate the phenomenon of freedom so as to put it to a crucial test. The following passage is a further illustration:—The "devout man—even when his will's spontaneous impulse leads to a virtuous act—proceeds nevertheless by an effort to make his act more virtuous (*i.e.*, more efficaciously directed to the virtuous end) than otherwise it would be. The advantage, then, of virtuous training and habits is not less inestimably great on the Libertarian than on the Deterministic hypothesis." Just so; but then, how are we to separate between what comes from the natural operation of virtuous training and what comes from Free-will? Devout Theism with virtuous training has a definite result on the ordinary law of phenomenal cause and effect; we can apply ourselves to bringing about these antecedents, in order that the effect may follow, and we can do no more. Liberty, as such, is an uncontrollable factor; we accept its behests, but cannot improve upon them. We cannot even measure its range; its amount is not sufficiently great to overpower unmistakably the blind causes; it must be one of those small agents that are swamped by the larger; its amount does not surpass the inevitable errors of observation.

The restraint of passing impulses by the permanent forces of the mind is a fact of incessant occurrence. It arises sometimes in the interest of virtue, sometimes in the interest of vice, and oftener still on occasions that are perfectly neutral. It occurs to everybody scores of times every day. We must all be aware that we are, generally speaking, tolerably uniform in our conduct in these respects; what we resist once, we resist again; what we succumb to once, we succumb to again. There are exceptions, of course; but we are seldom at a loss to account for these. The drunkard is sometimes reformed, yet not without a new antecedent, a moral force that is sufficient to the result. Determinists allege as psychical fact that volitions follow determinate moral antecedents with the same uniformity and certainty as physical effects follow their physical causes; that the will's course of

action is infallibly and inevitably determined at every moment by the circumstances (1) internal, (2) external, of that moment. On the other side, says Dr. Ward, "we have entirely denied this alleged psychical fact; in support of that denial we have appealed to a thousand undeniable mental phenomena". Now, I freely admit the phenomena adduced; I merely call in question the way of reading them. All that I can observe of their workings is in favour of uniformity; and I think that if there were exceptions, they must, at some time or other, appear in a form that no one would or could deny.

Dr. Ward abstains from all reference to the vexed question of Materialism, which is brought forward, in connexion with the present question by many advocates of Free-will. I do not think it requisite to mix the two questions; yet there is a mutual bearing that it is well that we should keep in view. Those that believe that to every mental fact there is a counterpart physical fact, are led to the uniformity of mental sequences on the basis of physical uniformity. Those that affirm Free-will, in the sense of variability of sequence, cannot admit that the mental and the physical go together. Whatever strength there is in the case for the full concomitance of the mental and the physical goes to confirm the doctrine of Determinism as against Free-will.

Dr. Ward is not the only sincere and cultivated enquirer that has been oppressed with the difficulty of reconciling law with our supposed Free-will, or liberty of choosing for our own good. The late distinguished political economist, Cairnes, and Mr. Goldwin Smith, are examples among many that have announced themselves as unable to discover a way out of the apparent contradiction. I have assigned, as one cause of the perplexity, the unappropriateness of the figurative word "Freedom"; and, as another, the awkwardness of the point of view when a man looks at himself in the act of willing between several alternatives. In the Critical Notice already referred to (MIND III., p. 398) I dwelt upon this last point, and have nothing new to bring forward respecting it.

A. BAIN.

VII.—CRITICAL NOTICES.

On the Philosophy of Kant (Shaw Fellowship Lectures). By ROBERT ADAMSON, M.A., Professor of Logic, Owens College, Manchester. Edinburgh: David Douglas. 1879.

In this little book, Professor Adamson has undertaken no easy task. He has attempted, in the space of about 250 pages, to show the general bearing of the work of Kant, and its relation to those philosophical problems which are at present calling most urgently for solution. And in this attempt I think he has attained a high measure of success, allowing for the limits imposed upon him by the Shaw Lectureship,

Indeed, no more weighty contribution has in recent times been made to the criticism of Kant, or of Kant's critics.

Professor Adamson begins by showing that the recent revival of the study of Kant has been a necessary consequence of the main scientific and philosophic currents of thought of the time. In this country it has been caused chiefly by a deeper apprehension of the sceptical consequences which Hume had drawn from the philosophy of Locke (consequences which for a time had been obscured by speculative compromises such as those which constitute the philosophy of Mill). In Germany, the advance of science itself has caused a need to be felt for the reconsideration of the ultimate problems of metaphysic. The question of the position of the knowing subject and his relation to the world of objects, in distinction from which he is conscious of himself; the question of the nature and mode of existence of the world which he knows, and which, as known, seems to be in some kind of dependence on the knowing subject; finally, the question of the position of man as a "concrete living agent," who is at once "an individual moved by individual passions," and a spiritual being conscious of himself as a responsible member of a moral order—all these questions were for the first time stated, or at least stated in the form which they must have for the modern world, in the philosophy of Kant. He first had clearly realised the double aspect of man's life as an individual who yet is not confined to his individuality, but transcends it even as a subject of knowledge or experience, and still more as a being capable of morality and religion. And he was the first who from this point of view attempted to solve the fundamental problems of Metaphysics, of Logic, and of Ethics.

Professor Adamson's discussion of the work of Kant takes the form of a polemic against two classes of Kant's interpreters—those who have regarded him as a Psychologist, or, in other words, who have confused the psychological with the transcendental problem; and those who have regarded him simply as an Agnostic, whose highest object was the limitation of knowledge to the field of experience or sense-perception. The great difficulty of setting aside such interpretations lies in the fact that, in both respects, the philosophical critic has to contend not only against the expositors of Kant, but also to some extent against Kant himself. For Kant, in his exposition of his transcendental theory, seems frequently unable to throw off the influences of the very individualistic psychology against which he is contending; and he often speaks of the distinction of phenomena and noumena, and of the limitation of our knowledge to the former, in words which are eagerly repeated by the Agnostic as a confirmation of his own opinions.

Professor Adamson's first and part of his second and fourth Lectures are devoted to the disproof of the psychological interpretation of Kant's transcendental criticism of knowledge. The question of Kant was, how the knowledge of any fact as such is possible; a question which it is idle to attempt to answer by showing the relations of one set of facts to another. An object is an object only for a

conscious subject; hence all science pre-supposes the general conditions of thought, under which alone objects can be known as such. Psychology is a science which deals with one order of facts among others, and cannot furnish us with a *prima philosophia* which shall refer to all objects whatever. The transcendental problem is therefore utterly obscured by those who, in spite of Kant's own warning, put the doctrine of the ideality of time and space on the same level with the subjectivity of secondary qualities; or those who suppose that physiology or psychophysics can throw light upon the conditions under which all objects are known. One of the greatest sinners in this way is Lange, the author of the *History of Materialism*, of whose so-called Kantianism Professor Adamson gives us in his fourth Lecture a very thorough and conclusive criticism. Lange, like many others, treats the "organisation" as the determining condition of all thought and knowledge, while he at the same time declares that the organisation itself is merely an "idea," or a collection of ideas.

The excuse for such misinterpretation lies in the ambiguous language of Kant himself, which is partly to be explained by the genesis of the Kantian philosophy. Kant's criticism of the philosophy of Leibnitz had, at an early period, brought him to regard thought as purely analytic in its movement, and even to accept the doctrine that the content of knowledge must be given in sense. Hume convinced him that through sensations purely as such, no object can be known. The effect of this double perception of the inadequacy of previous philosophy shows itself in the *Critique* in a two-sided polemic against those who conceive that knowledge is possible through pure sense, and against those who conceive that it is possible through pure thought; and Professor Adamson is, I think, right in saying that it is Kant's continual shifting from the one opposition to the other which perplexes his statements and makes him seem alternately to grant the position of each of these philosophers in order to disprove the position of the other. Hence, while Kant's argument shows at one time that sense is nothing for us apart from thought, and at another time that pure thought is as good as nothing for us apart from sense-perception, he seldom states quite clearly that the union of these two factors is "organic and necessary," but rather appears to leave them as disparate elements, which must be combined in order to the possibility of experience, but which in themselves have no necessity for this combination. Farther, instead of the required unity, he presents to us certain mediating principles, which are often spoken of as if *they* also were independent, like the factors between which they mediate.

In these circumstances, the business of the critic of Kant is to bring his different statements together, and to explain their apparent discrepancy. In doing so, he has often a choice between two alternatives: either to suppose that Kant had not completely freed himself from the influences of the theory he was opposing; or to understand his statements as in certain cases designedly imperfect and meant only to illustrate the one particular point with which he is engaged at the moment. And sometimes it may not be easy to determine which of

these explanations should be preferred. We must always remember that Kant was for the first time making his way into a new region of speculation. "If we had seen these roads before they were made," we should have better understood how difficult it was for Kant to find the appropriate ways of expression for the new and original theory which he had to express.

Two instances of this kind of difficulty may be mentioned. In the *Prolegomena*, in distinguishing between judgments of perception and judgments of experience, Kant seems to confuse the general question as to the conditions of experience, with the particular question of determining the place in the content of experience into which a given fact is to be brought. Thus, when Kant says that the judgment, "when the sun shines, the stone becomes warm," is a judgment of perception, which becomes a judgment of experience by being brought under the category of Causality, he for the moment leaves out of account that, on his own principles, the former judgment no less than the latter involves the conception of the world as a system of substances, whose successive states are causally determined in relation to each other; and that the only question is as to whether in one particular case two facts are to be causally connected. We do not, however, need to suppose that Kant forgot this, but only that he was desirous to illustrate his idea of an objective judgment, or judgment of experience; and that, therefore, for the moment, he abstracted from the fact that, on his own theory, the determination of any change as such involved its causal determination in relation to preceding changes, though it may be that our first judgment has not hit upon the change in reference to which the particular event in question should be determined. (*Cf.* pp. 34, 205 of the present work.)

The Deduction of the principle of Causality as it stands in Kant's second Analogy, raises similar difficulties, on which Prof. Adamson has thrown much light. In that deduction, Kant attempts to show that the perception of change, or the objective succession of different phenomena, involves the principle of Causality, or is possible to a self-conscious being only on condition that the principle holds good. The proof of this, on Kantian principles, involves the following steps:—First, that the mere succession of sensations does not give us the means of determining successive events in time as such; for a series of sensations cannot even be conscious of itself as a series. Secondly, that this determination cannot be got from time itself; for time by itself cannot be perceived, nor can events be dated in relation to time but only in relation to other events. Thirdly, that, therefore, in the apprehension of change, there is involved a synthetic act, by which we determine the phenomenon in question in relation to a previous phenomenon, in accordance with a category or schematised conception of relation, and that the category in question is Causality.[1] Now it is in stating *the first* of these points

[1] To complete the proof, we should need to take into account Kant's view as to the connexion of the principles of Causality and Substance. But it is not necessary to discuss this point here.

that Kant seems to fail, for instead of speaking of a series of sensations, he says that the apprehension of the manifold of phenomena is always successive, whether the order of the perceived phenomena is so or not; and illustrates this by the case of a ship drifting down a stream, whose successive positions can only be perceived in one order, as contrasted with the case of a house, whose parts can be taken in any order. He thus seems to admit not only a succession of sensations, but the perception of a succession of appearances as such, prior to the application of the category, which yet, he seeks to prove, is the foundation of our perception of objective change. Professor Adamson thinks that this is to be explained by the fact that Kant is here merely enforcing "the doctrine that determination of *existence* in time is distinguished from construction of an intuition which may or may not correspond to existence, simply by the thought necessity of order in the perceptions themselves" (p. 63). But, while expressing this, Kant's words suggest that the intuitions, apart from the synthesis of the understanding, are known as successive *appearances*, though not as an *objective* sequence of events; as in the passage in the *Prolegomena* (p. 48), where Kant says that "the senses set the planets before us now as moving on in their course, and again as turning back, and in this there is neither falsehood nor truth, so long as we are content to regard it all as mere appearance, and to make no judgment in regard to the objective character of the movements". Kant, in fact, seems here to use the particular case of the indeterminate order of the parts of the house to illustrate the general indeterminateness of the sequence of perceptions not brought under the category, and to abstract from the fact that a succession of perceptions or appearances, determined as such, already implies the category as one of the general conditions of experience. Or, if this is not so, we must regard the passage as indicating a relapse towards that psychological point of view, against which, in the main, Kant was contending. (*Cf.*, however, Professor Adamson's remarks, pp. 59-66, 210-14.)

The second part of Professor Adamson's argument, which is directed against those who would reduce Kant to a mere Agnostic, must be more briefly summarised. To state, as the whole result of Kant's criticism, the bare doctrine that knowledge is limited to phenomena, is misleading. For this statement "fails to bring into due prominence the deeper elements of Kant's doctrine, and robs of all significance his rich developments on the ultimate problems of metaphysic." It is indeed literally true that Kant denies the possibility of knowing things-in-themselves; but the 'thing-in-itself' is with him by no means a mere name for the unknown and the unknowable. Represented at first, in the beginning of the *Critique*, as the unknown cause of a sensuous affection, it becomes changed, as we advance to the 'Dialectic,' into the noumenon, or idea of completed synthesis, by means of which we criticise our actual knowledge and discern its limitation. The real, which is contrasted with the phenomenal, is, therefore, not simply a negation; it is the counterpart of an ideal of knowledge, which we *cannot* realise, though the conception of it is necessarily bound up

with the empirical knowledge which we *can* realise. This ideal is involved in self-consciousness, which is thus not only the source of the categories, the principles of unity in the world of experience, but which also puts us in relation to an intelligible world, in contrast with which the world of experience is seen to be merely phenomenal. Further, the idea of this intelligible world, which is *problematical* for reason in its theoretical use, receives an *assertorial* value from the practical reason, which obliges us to think ourselves as members of a 'kingdom of ends,' and to regard the phenomenal world as causally determined by the world of noumena. Finally, this causal determination of the phenomenal by the noumenal, which in itself seems to be an unintelligible union of opposites, is brought within the reach of thought by the *Critique of Judgment*, in which the application of the idea of an end to organised beings, and also to Nature as a whole, is vindicated as a necessary mode of thought, though it is denied to have the value of knowledge.

Professor Adamson does not attempt to criticise the Kantian system in detail, but he briefly points out what are its main defects. In the first place, the imperfect distinction of Kant between sensation and perception leads him to treat the sensible as such as an element of knowledge, and indeed as *the* element which alone gives reality to knowledge, whereas "the sensation, as such, never appears except in the perceptive act". "It is quite impossible for Kant to maintain both that unity of consciousness, and therefore thought, which goes beyond the individual fact, is indispensable for perception; and also that the only real factor in perception is that which, *per se*, is not for intelligence at all." In the second place, when the force of this criticism has been felt, the opposition between the phenomenal and the noumenal takes a different aspect. Experience, or our knowledge of the world under the categories of substance, causality, and reciprocity, is condemned as knowledge of the phenomenal, not simply because we want the necessary sense-perceptions for any higher knowledge; but it is so condemned because these categories are in themselves inadequate and limited. This inadequacy may be seen, not only from the paralogisms and antinomies to which they give rise, when applied to the noumena, but because they are antinomical in themselves, and cannot therefore be the ultimate forms of knowledge. On the other hand, the ideal of completed knowledge, or of an intuitive understanding, must not be regarded, as it is by Kant, as a mere identity which excludes all difference. Self-consciousness, which expresses itself in the categories of the understanding, and thus produces what Kant calls experience, is obliged by its own nature again to transform the experience thus constituted by means of the ideas of reason. In fact, reason must be regarded not simply as opposed to the understanding, but as a higher form of it, or as a higher stage of the same process. Hence the knowledge which we have of the unconditioned, of the object of reason, cannot be regarded as "a knowledge of it apart from the manifestation, which is an essential factor in it". It is because he does not perceive this, that the thing-

in-itself with Kant seems alternately to shrink up into the mere identity of abstract being, and to expand into an idea of the unity of Nature and intelligence. But the final significance of his philosophy lies in the latter and not in the former interpretation of it. "Throughout the development of his philosophy, we can trace the successive steps by which he endeavoured to render more and more concrete the ideal of supreme intelligence, but even in the final form of his metaphysic, from his peculiar conception of the isolated and sensuous impression as that which immediately brought us into contact with reality, and therefore of thought as merely secondary and in itself devoid of content, the old opposition appears between speculative knowledge and practical conviction." But "the full development of what is involved in Kant's original question, How is experience at all possible? would lead to a different conception of the relation between the elements, which appear subjectively as Reason and Understanding, objectively as the super-sensible in Nature" (p. 153).

I have been compelled to confine myself to a mere outline of the general argument of Professor Adamson, without taking notice of many important discussions of particular points in the Kantian philosophy which occur in the course of it. I am afraid that such an outline must compress beyond the limit of intelligibility what is already stated by him in the briefest and most concise way. But what I have said will probably be sufficient to show the thoroughness with which he has comprehended and stated the Kantian position and its relation to modern difficulties.

EDWARD CAIRD.

The Relations of Mind and Brain. By HENRY CALDERWOOD, LL.D., Professor of Moral Philosophy, University of Edinburgh. London: Macmillan, 1879. Pp. 455.

The position taken up in this work is exactly that described by Professor Bain in the following passage from the first chapter of his *Mind and Body*, as one of the ways in which their connexion may be viewed:—"There might be certain mental functions of a lower kind partially dependent on the material organisation, while the highest functions might be of a purely spiritual nature, in no way governed by physical conditions. For receiving impressions, in the first instance, we need the external senses; we are dependent on the constitution and working of the eye, the ear, the organ of touch, and so on; yet the deeper processes, named memory, reason, imagination, may be pure spirit, beyond and apart from all material processes."

After an opening chapter on "The Relations of Philosophy and Science," in which the necessity is shown of both to a true understanding of human life, we have a chapter on "The Structure of the Brain," giving a careful anatomical description, illustrated by plates, of the contents of the encephalon, but with a decided pre-eminence given to the cerebrum. Next follows Chapter 3 on "The Nerve System as dependent on the great Nerve Centre," treating of the

remainder of the nervous system and its peripheral connexions with the skin and muscles. The law that "frequency of use gives increased conductivity," is adverted to in reference, first, to sensory and, secondly, to motor fibres. This chapter ends with a statement of the leading facts respecting the nerves and organs of the three special senses of smell, sight and hearing, which the author takes as specimens of the sensory system generally.

Chapter 4, on "Localisation of Functions in distinct portions of the Cerebrum," is an important one in relation to the author's line of argument. Considerable space is devoted to an enunciation of the results of Dr. Ferrier's experiments on the brains of the monkey and the dog. The negative results of attempted stimulation of the frontal and posterior lobes of the cerebrum rather perplex the author, who is evidently desirous of making out the cerebrum to be a purely sensori-motor organ, but he endeavours to evade the difficulty by referring to the fact that the sensory centres are only distinguished as such by movements, and surmising that the "silent regions" are concerned in "forms of sensibility which are experienced with little movement of any part of the body". Still this, he admits, does not explain the silence of the frontal region, which he endeavours to account for by the supposition that "the governing power of the brain as a whole, involving the co-ordinated and regulated use of all its functions," comes from that region, and that electric stimulation is incapable of exercising this governing power. The difficulty here seems to be created by the author's method of ascertaining the nature of the connexion between mind and brain. He is trying to prove, as one branch of his argument, that the anatomical and physiological investigation reveal only *sensation* and motion as the functions of the brain. But, from the physiological side, it is only *motion* in response to physical impression that is or can be observed; and the same arguments by which we are led to infer the existence of sensation in other organisms prove ideation and emotion as well.

Chapter 5 institutes an elaborate "Comparison of the Structure and Functions of Brain in lower and higher forms of animal life," with the results (stated in chapter 6) "that the brains most elaborate in convolution are associated with the most highly developed muscular system," and "that more intricate arrangement and subdivision of the brain is connected with more detailed arrangement of the muscular system in contrast with mere mass of muscle."

Chapter 6 contains a summary of the "Results of Anatomical and Physiological Investigations," as described in the previous chapters. The author commences by insisting on the homogeneity of the nervous structure throughout the cerebro-spinal centres, denying that variety of arrangement implies diversity of function—a denial which reminds us of the different view of Mr. Lewes, who from identity of substance inferred identity of property, but added diversity of function as a result of diversity of arrangement. Professor Calderwood has not attended to the distinction between function and property.

After pointing out the similarity of arrangement between the sen-

sory and motor apparatus, he proceeds to analyse sensory action into four stages, *viz.* :—(1) the excitation at the peripheral extremity, (2) the movement along the nerve fibre, (3) the molecular action of the central cell, and (4) the sensation as "a result of the action of the sensory apparatus." Motor action is similarly analysed into (1) movement within the motor cell, (2) discharge of nervous energy, (3) muscular contraction, and (4) movement of the limb. The author here raises the contention, more fully argued in a following chapter, that in voluntary action some other origination of motor activity than the action of sensory cells must be looked for, and that it is to be found in the direct action of the will on the motor cells; but admits that the mode of its action is unknown. He also promises to consider in another chapter "whether the movement within a sensory cell and the experience known as a sensation are to be identified or regarded as distinct," but does not seem to fulfil his promise. The chapter concludes with the statement "that anatomical and physiological investigations as to brain and nerve, so far as they have yet been carried, afford no explanation of our most ordinary intellectual exercises."

The question of the connexion between sensation and the activity of sensory centres and between volition and the activity of motor centres, comes into prominence in the two following chapters, 7 and 8, under the titles of "Personal Experience as connected with Sensation" and "Personal Experience as connected with Motor Activity".

In the first of these two chapters the author commences by dwelling on the power of discrimination between two or more sensations as evidence of a discriminating Intelligence apart from the sensations. With this view he brings forward the conclusion come to in the preceding pages, that the function of the cerebrum is limited to producing sensations and effecting movements. He rejects "the hypothesis that the grey matter of the brain does intellectual work, while the grey matter of the spinal cord does not; or that the cellular tissue of the frontal lobe in the cerebrum can be credited with power of discrimination which does not belong to the grey matter of the occipital lobe." On this point we are disposed to go some distance with the author, not, however, by "levelling down" the cerebrum, but by "levelling up" the spinal cord.

In chapter 8, the facts of voluntary activity are dwelt upon as evidence of the existence of a Will distinct from the motor apparatus. Referring to the "voluntary endurance of pain in any form without shrinking," as an example of the purely voluntary element, Professor Calderwood says, "there is no law applicable to the sensory and motor apparatus which implies the imposition of a check on the transmission of the impulse communicated at the peripheral extremity of the sensory nerve when an incision is made. Spontaneous shrinking is the one inevitable result under the laws of nerve action." Here the author must be confronted with the notorious fact (to which he barely alludes, as if it were of no consequence) that the action of any of the nerve centres may be "inhibited" by the action of other higher centres. A man if he could live with his cerebrum removed would doubtless in-

evitably respond to an incision by muscular action more or less violent, but the cerebrum left intact is capable of inhibiting the action of the lower centres in a manner that may be understood, even with our present imperfect knowledge of the relation of its parts.

Supposing the functions of the cerebrum were merely sensori-motor, Dr. Calderwood's conclusions in these two chapters would still not follow. It may be contended that all our mental life is made up of sensations, ideas, and emotions, and the relations between them; that ideas are merely fainter forms of sensations, and emotions compounds of ideas and organic sensations; that the relations of sequence, co-existence, and similarity, are further conscious states arising out of the juxtaposition of the others; and that volitions are simply compounds of idea and emotion resulting in action. In this way all the varieties of our mental life might be traced to different combinations of the activitics of a sensori-motor apparatus. However, the mode of combination is much more intelligible on the hypothesis of the cerebrum being set apart for the work of combination.

Still more questionable is the way that Professor Calderwood deals with the general question of the relation of mind to matter. He speaks of the action of mind on matter as one would speak of the action of the wind on the waves. He admits, indeed, that the modc in which "the Will exercises this control over the cells, fibres, and muscular tissue, is unknown, but that such control is exercised," he says, "admits of no doubt." Now there is of course a sense in which it is true that the Will exercises control over certain "cells, fibres, and muscular tissues;" but all depends upon what the author means. Fortunately we are left in no doubt about this, for he tells us that "volition is not that which moves the muscles, but that which moves the nerve cells to act upon the muscles." Again, "what is not reflex as not being the product of movement of the sensory nerve, must be accounted for by energy from some other quarter, that is, from a sphere external to the nerve system, though within the nature of the person." These two passages taken along with other passages already quoted from the same chapter show clearly that the author regards mind as an entirely distinct substance from the body or any part of it. But in this sense the proposition that Will (which is a state of mind) exercises control over any "cells, fibres, and muscular tissue," whatever, admits of more than doubt. Some thinkers there certainly are who cannot see that mind acts on body in any sense whatever. That the wave of molecular motion along a sensory nerve should end in something which is not motion, or that the wave of molecular motion proceeding from a motor centre should originate from something which is not motion, is to them inconceivable. Thus Professor Bain says in his *Mind and Body* (p. 131):—"It would be incompatible with everything we know of the cerebral action, to suppose that the physical chain ends abruptly in a physical void, occupied by an immaterial substance; which immaterial substance, after working alone, imparts its results to the other edge of the physical break, and determines the

active response—two shores of the material, with an intervening ocean of the immaterial. There is, in fact, no rupture of nervous continuity." In expounding his own view, Professor Calderwood might have been expected to reckon somewhat more particularly with the counter-position that has been thus explicitly set forth.

In chapter 9 the author takes into consideration the facts concerned in Retentiveness, endeavouring to limit the function of the cerebrum to the retentiveness of muscular acquisitions. It is only necessary, however, to mention the instances, well known to every psychological student, in which cerebral disease has occasioned the resuscitation of such purely mental acquisitions as sentences in unknown or normally forgotten languages, to prove that such an endeavour cannot be successful. The author tries to find support for his attempted limitation by an analysis of Professor Bain's calculations as to the number of cells and fibres in the brain, and the number of intellectual acquisitions, with a view to showing that there are not enough of the former to find room for the latter.

Passing over chapter 10, on the "Use of Speech," and chapter 11, on the "Action and Reaction of Body and Mind," we come to chapter 12, on "Weariness, Sleep, and Unconsciousness". Here the author endeavours not very successfully to reconcile the facts coming under this head with his theory. He makes the most he can of the fallibility of memory in order to rebut the presumption of unconsciousness in the instances usually appealed to as proofs of the dependence of consciousness on material conditions.

Chapter 13, on "Brain Disorders," deals with the phenomena of idiocy and insanity. The author tries to make out that the intellectual abnormality of insanity lies not in the processes of thought, but in the materials and bases of thought presented through the senses, or, in other words, that the insane man reasons as correctly from the evidence of his senses as the sane man—all the fault lying with the senses. The facts seem to us rather to justify the opposite conclusion. It is, however, with regard to moral insanity that the author's position is the most inadmissible; for he characterises the abnormal moral tendencies of the insane as "animal propensities," which organic disease prevents the will from counteracting by its "governing power" and "moral forces". Without stopping to inquire how organic disease of the material organ could interfere with the action of the immaterial organist, we must protest against this relegation of all evil tendencies to the animal body, and all beneficial ones to the higher mind, as not only arbitrary but unphilosophical. To the psychologist, "appetites" or "propensities" are feelings, and therefore states of *mind*, irrespective of their objects or tendency.

The only point of importance in chapter 14, on "The Higher Forms of Mental Activity," is a challenge to "the somatist who would bring all human conduct within the scope of organic action," to account for "the recognition of duty," or the moral nature of man. There might not be much difficulty in meeting this challenge, provided a number of organisms be allowed, the interaction of which creates moral relations.

Apart from society morality cannot be explained on any theory; and the "recognition of duty," it may be urged, is only ordinary intelligence exercised on social relations. The problem then resolves itself into the question of the material basis of intelligence generally.

A "Short Summary of Intellectual Results," in chapter 15, closes the work.

JNO. T. LINGARD.

L'Idée moderne du Droit en Allemagne, en Angleterre et en France. Par ALFRED FOUILLÉE, Maître de Conférences à l'École Normale Supérieure. Paris: Hachette, 1878. Pp. 364.

The scheme of M. Fouillée's work is original and striking, and the execution of it has a well-sustained interest. No student of ethics will regret the time spent in reading these succinct and lively chapters; though I imagine that few Englishmen, at the present day, are likely to place a high value on the positive results of M. Fouillée's critical reflection. He considers that each of the three leading nations of Europe, Germany, England, and France, has a different school of ethico-political thought, and that each of these schools lays a different general idea at the basis of its theoretical construction of social order. The fundamental notion of the German School is Force; that of the English school, Interest; while for the French school—as the reader easily divines—is reserved the defence of Right. The practice of the three nations is in thorough accordance with their theories. That German policy puts Might in the place of Right, is a proposition which for a French public does not require much proof: England's habit of attending solely to "British interests" is avowed and notorious; whereas, as M. Fouillée informs us, the "vraie tradition de la France" is a "préoccupation de la justice pour tous, souvent poussée jusqu' à l'oubli de soi-même et de ses intérêts légitimes. France, in short, is a martyr to her ideal of Right; and, though crushed by the superior force of Germany, she is as content as Cato with the grandeur of her conquered cause, and unshaken in her belief in its ultimate triumph.

No English reader will grudge M. Fouillée this moral consolation for the material defeat of his country; especially since, from the summit of his ethical superiority, he makes an effort to look down as sympathetically as possible on the inferior social ideals of the two neighbour nations. He tries to represent the fundamental view of the "École Allemande" and the "École Anglaise" in the fairest possible light, and to see what either will come to when developed under the most favourable conditions; then, having pointed out the inadequacy of either even when so developed, he shows how both conceptions may be reconciled with, and find a certain place in, the higher ideal of the French school. Nor is his criticism in either case devoid of insight. For instance, there is much truth in his account of the process by which the modern German mind has passed from "mysticism" to "naturalism" through what he calls "symbolism"

—a not very felicitous term for the tendency of German metaphysicians to find in the sensible world a manifestation of the intelligible, and in the historic development of society a manifestation of reason. At the same time it can hardly be necessary for me to argue seriously against M. Fouillée's conception of German social philosophy. By skilfully combining the optimism of Hegel, the pessimism of Schopenhauer and Hartmann, the naturalism of the Darwinian school, and the diplomacy of Bismarck, it becomes possible to represent the simple formula "la force prime le droit" as the finally accepted expression in Germany of the "identité cherchée entre le rationnel et le réel"; but the composition of these heterogeneous and conflicting elements into the doctrine of an "École Allemande" gives us a mere chimera, calculated to serve no purpose but that of gratifying the patriotic spite of French readers. No doubt it is characteristic of the historical method which prevails among German thinkers to reject the "natural and imprescriptible rights" of the individual; to which, as M. Fouillée tells us, the French school still adheres. But it does not follow that Germans overlook or underrate the importance of moral ideas in social development. In subordinating the claims of the individual to the changing needs of the nation, they, generally speaking, conceive the nation not as a mere complex of non-moral forces, but as a moral being, destined to realise "Sittliche Ideen" and to solve "Cultur-Aufgaben" for itself and for humanity. Indeed, M. Fouillée himself seems to recognise this in a passage in which, as a Frenchman, he scorns the idea of being moralised by Germany. We can quite sympathise with this outburst of national feeling; we all find the Teuton's assumption of ethical and æsthetic superiority far from gratifying to our national *amour propre;* but the mere fact that this assumption is so largely and offensively made is hardly reconcileable with M. Fouillée's view of the non-moral doctrine of the "École Allemande".

We need not, then, examine M. Fouillée's argument to prove (Pt. I., c. 3) that a nation which makes Force its ultimate aim commits a mechanical error in suppressing the individual, since the greatest intensity, variety, and stability of social forces results from the minimum of constraint equally distributed: or his demonstration that a "civilisation fondée exclusivement sur le jeu fatal des Forces" carries within it a dangerous principle of self-dissolution leading to a war of egoisms, individual or tribal. The arguments are not in themselves ineffective; but as M. Fouillée introduces them, they are chiefly remarkable for their irrelevance.

In dealing with the Interest-Philosophy of the English school, M. Fouillée is on much safer ground; and his appreciation of leading English utilitarians is intelligent and sympathetic. It is true that in one passage he confounds with his fundamental antithesis of Interest and Right that other antithesis between Traditional Right and Abstract Right, in which the English and French minds are apt to take opposite sides; and he makes the curious mistake of attributing Sir H. Maine's "aversion pour les droits naturels" to a "préoccupation

exclusive de l'utile"; and generally fails to see that the opposition among English jurists of the present day to the "Law of Nature" is due rather to their clear separation between law as it is and has been and law as it ought to be, and their adoption of the historical method in studying the former, than to their adoption of the utilitarian method in determining the latter. Again, it is not always easy to make out whether the "principe d'intérêt" which M. Fouillée is criticising is conceived by him as "regard for happiness" or as "regard for one's own happiness": but perhaps he is hardly to be blamed for this, as the same want of clearness is found in most English discussions of utilitarianism. Indeed in the earliest and most ardent days of Bentham's school, its members, though united in their attachment to the "Greatest-Happiness Principle," seem to have had some difficulty in agreeing as to what that principle exactly was. M. Fouillée generally understands by it the combined propositions (1) that the general happiness is the proper end of social construction, and (2) that it can be and ought to be attained by an "habile fusion" of individual interests. He describes appreciatively the plan of social construction which English utilitarians have developed on this basis; explaining how "de Bentham à Stuart Mill, de Stuart Mill à M. Spencer, nous voyons la philosophie de l'interêt, emportèe par un mouvement irrésistible, se former peu à peu un idéal de liberté et d'égalité analogue, au moins par l'extérieur, à l'idéal dont la philosophie du droit propose la réalisation aux jurisconsultes et aux politiques." But he endeavours to show, by arguments for the most part familiar to English readers, that this "idéal de la societé utilitaire" is not "réalisable par le seul jeu des intérêts"; and then proceeds to urge that if it could be completely realised, it would still leave our higher aspirations unsatisfied.

"Représentons-nous l'humanité entièrement absorbée par la recherche des jouissances et entièrement satisfaite dans cette recherche même, réalisant ainsi en sa plénitude tout ce que peut contenir l'idée de l'utile, et trouvant enfin la paix dans l'équilibre des intérêts réconciliés. On nous dit que nous sommes alors en présence de 'l'humanité définitive,' qui ne fait plus qu'un avec la nature entière, et que le règne du droit est réalisé; mais c'est en vain qu'on veut arrêter l'essor de nos désirs: nous pouvons toujours dépasser cette humanité par la pensée, et la nature même demeure toujours inférieure à notre propre conscience. Dans la cité parfaite des utilitaires sommes-nous libres? Non, nous n'avons qu'une liberté extérieure qui ne nous donne pas la conscience de notre dignité intime. Sommes nous égaux? Non, l'égalité matérielle des 'parts de jouissances' dans la répartition sociale ne remplace point l'égalité de droit et de respect entre les personnes. Sommes nous frères? Non, nous pouvons agir comme si nous nous aimions; nous ne pouvons nous aimer: l'être soumis à de lois fatales, n'ayant pas de volonté à lui, ne saurait avoir de bienveillance pour les autres; n'ayant point la possession de soi, il ne peut faire le don de soi."

The last sentences of this passage indicate the cardinal point of M. Fouillée's own doctrine; which is more fully developed in the concluding and larger portion of his work, where the French idea of Right

is expounded and criticised. This portion begins with a rather patriotic description of the "historical vocation" of the French mind —with its "élan spontanè de la volonté" towards "les idées générelles et universelles"—for the establishment of the reign of Right and Justice; followed by a brief, and in some points superficial, account of the origin of the idea of Right in French philosophy, under the diverse influences of Stoicism, Christianity, and English Sensationalism, and its development in the nineteenth century. Having, in the course of this account, shown that it is "une doctrine devenue aujourd'hui classique en France que de faire reposer le droit sur la liberté morale," M. Fouillée proceeds to criticise the traditional ideas of Right and Moral Liberty. He urges forcibly that the Moral Liberty which confers on each individual man his inalienable claim to the respect of his fellow-men cannot be the mere power of choosing without motives or against the strongest motive. Such a power—supposing it proved that we possess it,—can obviously give no title to respect. Those who maintain the opposite have to face an inevitable dilemma. Either this "liberté d' indifference" is in itself absolute good, in which case all freely chosen acts must equally have the quality of good, and moral and jural restraints disappear; or it is only good so far as it conforms to a certain law, in which case it is on this law that we ought to base our system of Right, and not on the mere power of choosing between alternatives. What, then, is the true idea of Moral Liberty? M. Fouillée expounds it in the following terms:—

"Le mot de liberté . . . dans son sens positif, exprime la présence d'une force agissant par soi, l'activité spontanée et consciente, la volonté; la liberté doit donc se définir la volonté indépendante ou qui ne dépend que de soi. Reste à savoir en quoi consiste cette indépendance . . . c'est l'indépendance par rapport aux motifs inférieurs et extérieurs, aux motifs égoistes et matériels, car ces motifs expriment non la direction normale et essentielle de la volonté raisonnable, mais la déviation que les fatalités du dehors lui font subir; ils sont donc les servitudes. Dès lors la vraie liberté, si elle existe, ne consiste pas à pouvoir mal faire, mais à pouvoir bien faire . . . le premier de ces pouvoirs n'est pas necessairement la condition du second . . . car il se peut que le mal soit le résultat des contraintes extérieures, tandis que le bien serait le dégagement de notre propre activité, de notre vraie nature intelligente et aimante."

He does not maintain that liberty in this sense actually exists, but that it at any rate is an ideal which it essentially belongs to man to frame, and which is an actually important factor in social evolution, from the force which, as an idea existing in men's minds, it exercises towards its own—at least approximate—realisation. He holds, however, that we cannot say that liberty in this sense does not exist; for there is a mystery in man unsolved by science, and "ce mystère . . . est le fondement métaphysique du droit."

A notion which, as M. Fouillée admits, the whole course of science tends to show to be imaginary, seems rather a fragile basis for social order. But, passing over this point, I fail to see how the acceptance of this idea of liberty would manifestly lead to the realisation of

"liberté extérieure" as ordinarily understood in free communities. If true freedom is not the power of doing what one may happen to like, but the power of doing good, it is a kind of freedom on which the most despotic theorist has never wished to place restraints. Despotism, in civilised ages, has always justified itself on the ground that if you let men do what they like, they will, instead of "developing their true, intelligent, and loving nature," fall under the dominion of "inferior and egoistic motives". All would admit that, in M. Fouillée's words, "le bien volontaire est supérieur aux autres,—parcequ'il est seul conscient, senti, aimé;" the question still remains whether we shall actually realise it by leaving men free to do what they like. I do not see that M. Fouillée ever fills up this gap between the liberty he shows ground for respecting and the liberty that he practically aims at securing. I do not see, for instance, why the "true liberty" should require equal distribution of property as a "garantie extérieure"—one may exhibit rational benevolence with only the widow's mite, or why it should require "conditions identiques d'admissibilité aux fonctions," or any of the other points of a republican's creed.

I can only just notice M. Fouillée's concluding book, in which the idea of Equality is discussed. He appears to me to treat the problem of reconciling Liberty and Equality far too lightly, as though he were hardly conscious of the continually widening chasm between the two ideals, which the controversy between socialists or quasi-socialists and the partisans of "laissez-faire" has recently made so prominent. I must not, however, forget to say that this last book includes a lively and effective criticism of M. Renan's aristocratic paradoxes.

HENRY SIDGWICK.

Reine Logik. Von Dr. J. BERGMANN, ord. Prof. der Philosophie an der Universität zu Marburg. Berlin: Mittler, 1879. Pp. 434.

The primary division of the field of Logic into 'Pure' and 'Applied' rests, according to Prof. Bergmann, on the distinction between the immediate and the mediate aim of thought, the immediate aim being Thinking itself, the mediate aim Knowing: under Pure Logic, thought is regarded as *ἐνέργεια*, under Applied Logic, as *κίνησις*. Logic in general is the Theory of the Art of Thinking ('thinking' being equivalent to 'judging'), the Science of the normal constitution of Thought. Pure Logic accordingly "treats of the normal forms of the Judgment, Applied Logic of the normal forms of the application of these to the perfecting of Knowledge . . . Pure Logic shows, as it were, the mechanism of thinking in a state of rest, Applied Logic shows it in a state of activity; or, to use another metaphor, the former is the Anatomy, the latter the Physiology, of Thought as it ought to be . . . Pure Logic may be called the theory of Thinking as Thinking, Applied Logic that of Thinking as Knowing."

The Judgment is, then, treated as the centre round which the

Science of Logic may best be grouped; the normal forms of the Judgment, as far as possible away from their application to the search for knowledge, being the subject of the present work. Professor Bergmann divides the doctrine of Judgment into two main parts: (I) The Import of Judgments, and (II) The Truth of Judgments. In the first part, after a careful and intricate preliminary discussion of the nature of judgments and of the processes supplementary to their formation, Prof. Bergmann's views are further developed by a consideration of the subject under three heads:—(1) *Die Anschauung*, as foundation of the Judgment; (2) *Die Vorstellung*, as constituent part of the Judgment; and (3) The Judgment as verdict on the value of a *Vorstellung*. Part II. comprises (1) Material Truth,—being chiefly a discussion of what "correctness" means, as applied to *Vorstellungen*, and an examination, with a new wording, of the Axioms of Consistency; and (2) Formal Truth,—being a full treatment of the doctrines of immediate inference and syllogism.

The most noticeable feature of the work (apart from its metaphysics) is the view taken of the nature of predication: of the relation between Conception[1] and Judgment on the one hand, Conception and Intuition on the other: especially the elaboration of a difference between Judgment and the "mere quality-less and modality-less predicating" which Professor Bergmann gives as a definition of *Vorstellung*.

Stated shortly, Prof. Bergmann's view is as follows:—The processes supplementary to the formation of a judgment are three: *Anschauung*, a Synthesis; *Vorstellung*, an Analysis; and finally a Criticism,—a verdict as to whether the synthesis completed in the Intuition and analysed in the Conception, is valid or not. The Conception is a reflection on the Intuition (*i.e.*, on the products of Intuition), and the Conception, combined with a verdict on its validity, is a Judgment.

The Intuition, then, is the root of both the Conception and the Judgment.[2] It is the positing of things as possessing attributes. This act it is which calls 'things' into existence: material objects, as such, are not the raw material on which Intuition works, but by Intuition we imprint the form of 'thinghood' on the raw material,

[1] I think it will be best to translate *Vorstellung* by 'conception' throughout, in spite of predication being made its distinguishing feature, and in spite of the fact that Kant appears occasionally (*e.g.*, *Log.*, Rosenk. III., p. 282) to use *Vorstellung* for that which is here called *Anschauung*, while Drobisch (*Log.*, 3rd ed., § 40) uses *Begriff* for the same purpose. Prof. Bergmann's account of his own distinction between *Vorstellung* and *Begriff* is, that he uses the former word both for the momentary and the permanent product of *Vorstellen*, and that *Begriff*—the sum of one's stored-up knowledge (*Wissen*) about an object—includes the permanent *Vorstellung* just as the Judgment includes the momentary one. The *Begriff* is a *Vorstellung* (in the permanent sense), when critically elaborated.

[2] Prof. Bergmann leaves it rather doubtful, however, to what extent he considers the Intuition to be 'contained' in the Conception, and therefore in the Judgment.

whatever it may be. Thinghood, Substantiality, Existence, are synonymous terms. The products of Intuition are objects, and every object is a possible S of a 'Conception,' and possible predicates belong to it.

Conceptions, beside their division into individual and general, are, like Judgments, divisible into existential and attributive. Every Conception contains a predication, has a Subject and a Predicate (*Das Sein* being of course predicated in existential, *Das P-Sein* in attributive conceptions). And attributive conceptions may[1]—like attributive judgments—be viewed as the binding together of two existential conceptions. To conceive is to reflect on the products of our Intuition, to set them up as (individual) objects, to notice them and their attributes, to analyse the synthesis by means of which the objects were formed from the raw material.

Judgment is "opposed, not to Conception in general, but to *mere* Conception". It is Conception with something added to it. This something which, when added to Conception, raises it to the dignity of Judgment, is an element to which great importance is given by Prof. Bergmann, who complains that it has been rather overlooked by other writers. Even when some definite attribute is predicated of some thing, there is according to Prof. Bergmann, nothing more than a conception. When, however, we cease to be content with mere predication, and begin to criticise,—to give a verdict on the correctness of our predication—a judgment emerges. In the Judgment, there is always "combined with the mere apprehension (*Auffassung*) of an object as existing simply or as possessing such and such attributes, a critical reflection on the validity of such apprehension, a verdict on its correctness, a confirmation of it or a rejection". This reflective attitude is what, in his view, constitutes the difference between Conception and Judgment.

It is clear that Prof. Bergmann's doctrine may be attacked either from the side of the Judgment or from that of the Conception. On the one hand the question may be raised whether this *Auffassung* is not to all intents and purposes Judgment,—in which case it may be objected that 'Judgment' as here defined becomes a superfluity, a mere reduplication; on the other hand the question may be raised whether the 'critical attitude' is in reality anything more than *intelligent* predication,—in which case it may be objected that 'Conception' as here defined becomes equally unnecessary, being simply a name for semi-intelligent Judgment, judgment not fully conscious of its own real meaning. Where, it might be asked, is any line to be drawn between critical and uncritical apprehension of a thing as possessing attributes?

It is not exactly clear whether Prof. Bergmann would himself consider the novelty to reside in his 'Judgment' or in his 'Conception'. In some passages he seems to imply that logicians have rather neglected the reflective, or critical, element in the Judgment; in others, that

[1] Prof. Bergmann objects, however, to this view as the fundamental explanation of the Judgment, as a case of ὕστερον πρότερον.

the assertive element in the Conception has been in general overlooked. On the whole, however, I incline to the view that he makes of Conception something practically indistinguishable from Judgment; and if so, of course 'Judgment' as defined by him is only distinguishable from 'Conception' as being a Judgment about a judgment, instead of a Judgment directly about things.

Two considerations will chiefly serve to support this opinion. Ueberweg, whom Prof. Bergmann quotes as holding a view nearest to his own, defines Judgment (*Log.*, 4th ed., p. 154) as "the consciousness of the objective validity of a subjective combination of conceptions . . . *i.e.*, the conscious answering of the question whether between the corresponding objective elements the analogous combination exists": but Prof. Bergmann says, between this view and his own, lies the essential difference that, while Ueberweg seems to consider that the reference to the objective bearings of the case first comes into existence in the Judgment, his own view is that this already takes place in the Conception—that the apprehension, the objective validity of which is pronounced upon in the Judgment (which apprehension he gives, we have seen, as the definition of the Conception) is already "eine objective oder besser objectivirende".

In what respect, then does this *objectivirende Auffassung* differ from Judgment? Because, says Prof. Bergmann, it stops short at "mere predication," without explaining either negation or modality. This appears, in fact, to be the key to the whole position. If mere predication—the argument runs—could constitute a negative[1] judgment, then negation must belong to the predicate, and negativity be a quality of the things spoken of: but negative predicates, in this sense, are 'unthinkable'; therefore negative judgments cannot be explained by mere predication; and if not negative judgments, then neither can affirmative ones,—for affirmation and negation are completely complementary and mutually explaining.

One cannot help asking, If affirmation implies a correlative negation —as of course it does—what is the meaning of "quality-less predication"? Is such predication possible, except so far as the person predicating can manage to predicate loosely and unintelligently enough to remain blind to the real meaning of his predication? And further, Does not Prof. Bergmann's own statement of the doctrine of incompatible attributes (§ 23) practically amount to a full acceptance of negative predicates, and a perfectly correct explanation of the manner in which they are possible and the meaning which they really bear? In fact, Prof. Bergmann's views on the subject of negation appear always (until at least incompatible attributes are being treated) rather liable to confusion. One of the difficulties, for instance, raised to the possibility of negative predicates is that their supposition demands a negative-negative predicate, and so on *in infinitum*: but one does not

[1] The differences in modality,—following Kant's distinctions of apodeictic, assertory and problematic,—are found, by an essentially similar process, to lead to the same result.

see why any one so ready as Prof. Bergmann[1] to attend to the spirit and to disregard the letter, should hesitate to cancel every *pair* of negatives as mutually destructive and a mere wordy encumbrance. What, for instance, could the predicate 'not-not-white' mean, except simply white; or the predicate 'not-not-not-white, except some attribute of which the only thing known is that it is incompatible with white? Again, the statement (§ 6, 5) that "we only know invalidity, incorrectness, falsity, through reflection on our negative judgments," seems rather to conflict with his main view that a negative judgment cannot arise until by reflection we find a conception invalid (incorrect).

The second consideration which may be mentioned in support of the view here taken of Prof. Bergmann's doctrine, is the meaning of "validity" (or "correctness"—for the terms are used synonymously throughout) as applied to the *Vorstellung*. Prof. Bergmann naturally devotes a rather large space to this question, and the discussion is full of instructive suggestions.

The quality of correctness-incorrectness is, of course, said to be something different from that of truth-untruth. "True" is applicable to the Judgment only, not to the Conception or the Intuition. The conception contained in a true judgment may be incorrect, and that contained in an untrue judgment may be correct.

Next, the correctness or incorrectness does not refer to the analysis, as such, which takes place in the conception, but the correctness or incorrectness of the synthesis constituting the *intuition* is that which validates or invalidates the conception. [Why not, then, simply speak of the correctness-incorrectness of the intuition; especially as it was expressly said (§ 6, 8) that conception is the reflection on the intuition, not the latter *combined with* the reflection on it?]

Now a conception is to be called correct when it agrees with that which *is*, with the actual state of the case. This occurs:—

In a singular existential conception, when its S exists (when the Universe includes that S);

in a general existential conception, when the Universe includes two or more objects belonging to its compass;

in a singular attributive conception, when the S possesses (includes) the attribute P. The correctness of a singular attributive conception presupposes that of the corresponding existential conception.

in a general attributive conception, when the whole number of objects belonging to its compass include the attribute P. The correctness of a general attributive conception also presupposes that of the corresponding existential.

It is evident, then, that the "correctness of a conception" requires

[1] As witness the translations of the grammatical S into the logical one, or of the propositions where the same word figures for S and P; or the list of names considered Abstract; or again, the fact that he avoids the mistake (fallen into by Prof. Jevons) of supposing that a valid conclusion could ever really be obtained from two negative premisses.

the "truth of a judgment" to explain it, just as much as the latter requires the former: whenever, and only when, we have ground for knowing a "conception" to be correct, we have ground for knowing the corresponding judgment to be true; and whenever, and only when, we have ground for knowing a judgment to be true, we have ground for knowing the corresponding "conception" to be correct.

Further, the agreement of a conception with the actual state of the case is always the "agreement of a conception with itself". Accordingly, correctness of a conception may be defined simply as Identity, incorrectness as Contradiction: and the Principle of Identity may be stated "Every correct conception is identical"; the Principle of Contradiction "Every incorrect conception contradicts itself"; the Principle of Excluded Middle becomes "Every conception is either correct or incorrect"; and a Principle of (Sufficient) Reason is added, based on the fact that we have no *absolute* proof of "agreement of a conception with the actual state of the case," and can therefore, in this sense, only give it hypothetical certainty, guaranteeing it by means of some other already accepted as correct. We attain, in fact, (to use Kant's distinction) 'empirical' not 'transcendental' correctness. The Principle accordingly runs: "A conception is correct when it has a correct *Grund* (If A is B, C is D; now *A is B*) or an incorrect *Gegenfolge* (If C is not D, A is B; now *A is not B*): and incorrect when it has a correct *Gegengrund* (If A is B, C is not D; now *A is B*) or an incorrect *Folge* (If C is D, A is B; now *A is not B*.)

Here again "correct conception" and "true judgment" are surely indistinguishable. On the whole, the boundary between 'conception' as here used, and 'judgment' as ordinarily understood, seems to be imaginary, and the difficulty of distinguishing them in practice to be rather increased than diminished by Prof. Bergmann's manner of defining them. "Quality-less and modality-less predication" is in fact a contradiction in terms, and it is only by forgetting these epithets, putting a real predication into the conception, and thereby confusing it with judgment, that Prof. Bergmann is able to proceed. Why not abide by the simpler explanation that in the Conception a fact is left unquestioned, and therefore unanswered, which in the Judgment is both questioned and answered?

I think it clear too, that the imaginary distinction between this *Vorstellung* and Judgment is really traceable to the difficulty unnecessarily—and, as above shown, not even consistently—raised, about the meaning of negation. A further instance of the uncertainty of Prof. Bergmann's views on the subject of negation, is the distinction (considered by him as at least *supposable*) between "nicht-richtig" and "unrichtig" (§ 21, 5.). This is done, of course, in order to put a "heterological" meaning into his Axiom of Excluded Middle, but it rests on exactly the same illusion as led certain metaphysicians to suppose an object simply divested of all its attributes, one by one. Besides, is not the attempt to turn the Axioms into heterological judgments based on a misconception of their real value, such as it is?

Is it not sufficient justification for a truism, that it is expressed in order to prevent people from being inconsistent?

The remaining portion of the book is occupied with Immediate Inference and Syllogism. Prof. Bergmann attempts perhaps to draw a firmer line than is possible between these two kinds of "Inference"; but the doctrines themselves appear to be carefully set out, and the use made of the Principle of Reason is worthy of attention: Syllogism, according to his view, rests upon this, while Immediate Inference does not.

As a whole, the book contains much that is interesting and useful. One notices a constant care (though, as I have shown in the case of the origin of negative judgments, not always successful) to avoid the error, so common amongst writers on Logic, of circular explanation; and a remarkable freedom from the equally common error of supposing a sharper division to exist between certain pairs of opposed notions than actually does exist: as instances of this, may be mentioned the remarks about the opposition of Formal and Material, of "is" and "ought to be," of Realism and Idealism. The general consistency, too, of Prof. Bergmann's views, is considerable—the stretching of principles to their legitimate consequences and beyond the results to which people are commonly content to apply them.

In many minor points, not directly connected with the main view, Prof. Bergmann seems to hold the latest and the coming views: careful attention has been paid by him to the opinions of the best modern writers in Germany. It is unavoidable, of course, that a connsiderable space—especially of the earlier portion of the work—should be occupied with Psychology and Metaphysics. It was necessary to expound the fundamental convictions out of which, as Prof. Bergmann says, his theory has been developed; and readers will not be disposed to quarrel with this, or in fact with many of the separate discussions themselves.

As to the main division of the science, no doubt it will not bear much pressure, and the attempt to preserve it quite consistently must always lead a writer into difficulties: still, its convenience is a sufficient justification. Readers of this first volume of Prof. Bergmann's *Allgemeine Logik* will look with interest for the publication of the second volume; and those who have failed to fully comprehend any of his views as at present stated, will have another opportunity of doing so, when the exact results of these in the *Angewandte Logik* shall become more evident.

ALFRED SIDGWICK.

Immanuel Kant's Erkenntnisstheorie nach ihren Grundprincipien analysirt. Ein Beitrag zur Grundlegung der Erkenntnisstheorie. Von JOHANNES VOLKELT. Leipzig: Voss, 1879. Pp. viii., 274.

Herr Volkelt has a quarrel with all other expositors of Kant. They appear to him to have set to work in their labours under the delusive idea that in the Critical Philosophy there must be found, and is found,

a certain unity of principle, whatever that principle may be. His analysis, however, has convinced him that the Kantian system is really a very complex product, exhibiting the consequences of more than one principle, the full import of which was never clearly apprehended by its author. He claims, then, "to understand Kant better than Kant understood himself," and to be able to bring to light the fundamentally opposed principles upon which Kant, with only half-consciousness, proceeded in his work of construction, and out of which there naturally emerged a theory of knowledge throughout full of weakness, error and contradiction.

The fundamental theorems which Volkelt regards as the unconscious motives dominating Kant's thought, are two in number; the one stated with some explicitness by Kant, though its full bearing and consequences were never realised by him; the other only to be detected by showing that it is the basis on which some of his characteristic doctrines rest. The first, which to Volkelt is absolutely the primary proposition of philosophy in general, is called the Positivist principle, or principle of completed scepticism. It is the proposition, familiar enough, that experience consists of conscious states, *Vorstellungen*, and that cognition is only of *Vorstellungen*. Now, beyond question, Kant does express a principle in words resembling the above, but it is hardly necessary to say that what shall be regarded as the consequences of a proposition depend not on its verbal statement but on its real significance. Identity of expression is not identity of meaning. It is impossible to ascribe to Kant's principle the meaning supposed by Volkelt to be its essence. For, according to the latter, the positivist proposition implies that the one fact of knowledge is the immediately given, momentary, transitory atom of conscious experience. Anything beyond this is *trans-subjective*, has reference to things-in-themselves, and cannot be justified by experience, for *Vorstellung* cannot transcend itself. The experience of individual *Vorstellungen* is an immediate fact, and Volkelt, who seems surprised to detect in Kant the curious idea that the categories form an element in any portion of experience, in any object, will regard such general notions as *Vorstellungen* somehow associated with intuitions. It need cause us but small surprise that a critic who identifies Kant's statement as to experience with the positivist principle so interpreted, should find innumerable difficulties, obscurities and contradictions in the Critical System, and should be tempted to look about for the origin of such confusion.

This origin Volkelt finds to be the operation of a second theoretical principle, also employed with only half-intelligence by Kant, the principle of Rationalism—that determinations of thought are decisive as to the relations of existence. To this theorem he traces Kant's so-called subjectivism, his rejection of the view that the forms of intellect may be *at the same time* forms of real things, his distinction between phenomenal and noumenal, and generally the whole metaphysic that depends on the notion of *noumena*. Throughout there appear the confusion and chaos consequent on the application of two principles, the limits and relations of which were not clearly appre-

hended, and Volkelt has difficulty in finding terms hard enough to characterise the weak and "staggering state" of the Kantian system.

The doctrine of the thing-in-itself is, of course, a crucial point in any exposition of Kant. We can only say that in Volkelt's book we have found nothing beyond a reproduction of the argument first advanced against Kant by Schulze (Æneside mus), while Volkelt's own view as to the thing-in-itself completely bars the way to adequate comprehension of Kant's real meaning. It may be added that most of the common mis-interpretations of cardinal doctrines in Kantianism are to be found in Volkelt. He thinks the 'Refutation of Idealism' an attempt to prove the existence of *Noumena*, maintains that the thing-in-itself is the only correlate to the unity of consciousness, and holds that Kant illegitimately but unavoidably applies the categories to the world of things-in-themselves.

Volkelt's own theory of knowledge, worked out in the criticism of Kant, may be summed up in two positions. Immediate experience is knowledge, and it consists of isolated *Vorstellungen*. Some *Vorstellungen*, or combinations of them, possess the property of necessity for thought (*Denknothwendigkeit*), and so compel the mind to receive them as true pictures of trans-subjective fact. On the whole, the theory of Schulze, or of the Scottish school revived in an even less critical form.

It is only justice to say that Volkelt's work, apart from its main idea, contains much acute and pointed analysis of doctrines in the *Kritik*. His third section, "Kant's metaphysical Rationalism" (pp. 87-160), contains good matter, and we hope to return to it in a longer notice of the many recent German contributions to Kant-literature.

ROBERT ADAMSON.

VIII.—NEW BOOKS.

[*These Notes are not meant to exclude, and sometimes are intentionally preliminary to, Critical Notices of the more important works later on.*]

Mind in the Lower Animals in Health and Disease. By W. LAUDER LINDSAY, M.D., &c. 2 vols. London: C. Kegan Paul, 1879. Pp. 543, 571.

This work contains an immense collection of facts with regard to the mental powers of animals; the first volume dealing with Mind in Health, the second with Mind in Disease. An introductory part on Comparative Psychology (in which the use of scientific psychological terminology is expressly disclaimed) compares the mental status of savages with that of the higher mammals and birds, greatly to the advantage of the latter. The author is an uncompromising advocate of the essential similarity of the human and animal mind. The body of the first volume next contains five separate parts (each comprising several chapters), touching respectively on Morality and Religion; on Education and its Results; on Language; on Adaptiveness; and on

Fallibility. In these parts, Dr. Lindsay asserts the existence of conscience in animals, especially dogs; suggests that they possess religious feelings towards man or towards inanimate objects regarded as fetishes; points out their capacity for self-education, as well as for education by men and by one another; gives an extended meaning to the word 'language,' which enables him to defend the theory of its existence in a vocal and non-vocal form amongst animals; discusses the use of implements, knowledge of numbers, or power of calculation; and argues against the supposed infallibility of instinct. The treatment of these subjects is extremely unsystematic, and the connexion of the argument is often difficult to trace. All the points are illustrated by numerous stories, with the names of the authorities generally appended. The second volume, dealing with Mind in Disease, commences, like the first, with a comparative view of the phenomena in the human and the animal subject. The Symptomatology of Animal Insanity is then treated at great length, but with little order, under the heads of Perversions of Natural Affections; Artificial Insanity; Intoxication; Dreams and Delusions; Stupidity; Suicide; Crime and Criminality; Physiognomy of Disease; Physical Causes; Moral Causes; Individuality; and Sensitiveness. The miscellaneous nature of these titles sufficiently illustrates the haphazard arrangement of the subject. A concluding part, Practical Conclusions, deals with man's treatment of the lower animals. A very copious bibliography and several well-arranged indexes occupy together 170 pages. The work throughout displays great industry, but many of its statements are somewhat extravagant, and several of the illustrative stories are, to say the least, improbable. The most important portion of the work is that which details the observed cases of animal insanity, in which the author's specialist acquirements enable him to make instructive comparisons with the analogous symptoms in human lunatics.

Seeing and Thinking. By the late William Kingdon Clifford, F.R.S., Professor of Applied Mathematics and Mechanics in University College, London, and some time Fellow of Trinity College, Cambridge. *Nature* Series. London: Macmillan, 1879. Pp. 156.

Under the above title there are here brought together three lectures delivered by Clifford some years ago, on "The Eye and the Brain," "The Eye and Seeing," "The Brain and Thinking," with an extra lecture "Of Boundaries in general". The last, though not specially connected with the others, is an admirable specimen of Clifford's expository power. The three lectures, while setting out in an easy and familiar way, the view of brain-action always adopted by the author, which supposes the optic thalami and corpora striata to form a relatively independent sensori-motor system within the higher system of the cerebral hemispheres, contain some points not urged, or not so explicitly urged, by him elsewhere. In particular, he adopts the view that conscious attention on occasion of this or that nervous process depends on a vaso-motor action at the particular point, determined

from the cerebral hemispheres. This leads him (p. 96) to distinguish the *appetite* from the mere *sensation* of hunger as "the state of being attentive to those connexions whereby, when a piece of food is put into your mouth you will naturally proceed to masticate and to swallow it"; more generally, Appetite is the name for "the concomitant states of the mind and body in which we are more particularly ready to reply to certain suggestions from without". Again, the *emotion* of anger "is most probably a state of extreme attention to those particular connexions which hold together the sensation of an enemy attacking you and the action of defence which you make against him". The social origin of *conceptions* or general knowledge is impressed with Clifford's wonted force.

Child and Child-Nature. Contributions to the Understanding of Fröbel's Educational Theories. By the Baroness Marenholtz-Bülow. Translated from the Second Edition by Alice M. Christie. London: Swan Sonnenschein, 1879. Pp. 186.

A very good rendering into English (with an interesting preface by the Translator, pp. x.) of a work written, originally in 1862, by one of Fröbel's most devoted disciples. The book contains, in short compass, everything that is necessary for a first understanding of Fröbel's remarkable theory, so profoundly inspired with true psychological insight into the early development of the human mind. It is only to be regretted that the author, like some other followers of her master, cannot refrain from mixing up a quite unnecessary amount of sentimental rhetoric with the real message she has to tell to the educators of the present time. Fröbel had a strong mystical vein, which in him must be accepted with his original genius; but a less clouded speech may fairly be expected from his disciples.

Ceremonial Institutions. Being Part IV. of the *Principles of Sociology.* (The First Portion of Vol. II.) By Herbert Spencer. London: Williams & Norgate, 1879. Pp. 237.

Of the twelve chapters here published, seven have already seen the light in periodical publications, but only six in England (*Fortnightly Review*). The author has commenced the publication of Vol. II. in Parts, because the separate divisions have a certain distinctness of subject, and would all of them together make too large a volume, while the earlier ones, though complete, would have to be kept back "for a year, or perhaps two years," till the later ones (VI., VII., VIII.) are written. The next part to be issued (V.) will treat of Political Institutions.

Kant's Critique of Practical Reason and other works on the Theory of Ethics. Translated by Thomas Kingsmill Abbott, M.A., Fellow and Tutor of Trinity College, Dublin. Being an Enlarged Edition of *Kant's Theory of Ethics.* With Memoir and Portrait. London: Longmans, 1879. Pp. lxiv., 438.

Mr. Abbot has in this edition included the Analytical part of the *Kritik der praktischen Vernunft* omitted in his previous translation of

Kant's writings on the general *theory* of Ethics. The volume thus includes now, besides the *Fundamental Principles of the Metaphysics of Morals* complete, and the First Part of the *Philosophical Theory of Religion*, the first complete English translation of the *Krit. d.p.V.* An Appendix contains the Essay *On a Supposed Right to tell Lies from Benevolent Motives*, with a short extract "On the saying 'Necessity has no Law,'" from another of Kant's Essays. In the Memoir prefixed, Mr. Abbott has little or nothing to say on the subject of Kant's philosophical development, but, besides remarking generally on Kant's ethical position, brings forward in an interesting way the less known works containing his physical speculations.

On Mr. Spencer's Formula of Evolution as an exhaustive statement of the Changes of the Universe. By MALCOLM GUTHRIE. London: Trübner, 1879. Pp. vii., 267.

As its title suggests, this work is an examination of the argument of Mr Spencer's *First Principles*. The author does not mean to pronounce an opinion on the value of the doctrine of Evolution itself so far as it formulates certain uniformities of sequence among phenomena; but he inquires whether Mr. Spencer's formula of evolution regarded as the ultimate principle of philosophy satisfies the conditions of such a principle as laid down by himself. He first of all asks whether Mr. Spencer's definition of evolution, in terms of the factors matter and motion, supplies an adequate explanation of the world. Carrying back in imagination the process of dissolution of the cosmos till all differentiation is got rid of, he asks whether from a perfect homogeneity of primitive atoms any process of change is possible in the absence of some extraneous influence which is already an element of heterogeneity. He holds that such a process is unthinkable, and that Mr. Spencer really attains to the first stage in the process of evolution by assuming an initial degree of differentiation (between the nebulæ and their medium, and the various elements). In like manner the author seeks to demonstrate that Mr. Spencer fails to account for the genesis of organisms and consciousness. The supposed process, he thinks, is not a real but merely a verbal one. Having thus satisfied himself that Mr. Spencer's formula of Evolution does not cover the facts of life, adaptation, consciousness, &c., the author proceeds to inquire whether it can be made to furnish an adequate explanation of all changes by help of the author's idea of Force. He seeks to show that this is only possible by conceiving of Force as something extraneous to matter in motion, and occasionally interfering with it in the shape of a *deus ex machina*. And, finally, failing to get light in this direction, he tries to amend Mr. Spencer's formula so as to include all the factors, and more especially Feeling, but cannot by this means attain anything but a vague formula possessing no constructive value. And so he concludes that any such theory of Evolution as Mr. Spencer's, which seeks to account for and "ideally construct" the changes of the universe by some assumption as to a primitive state of homogeneity, is doomed to failure. The author adds an examination of Mr.

Spencer's doctrine of the Unknowable, and of his mode of reconciling Religion and Science, and ends with an epitome of some of the principal criticisms of Mr. Spencer's system by English and American writers.

Problems of Life and Mind. By George Henry Lewes. Third Series (continued). Problem the Second—"Mind as a Function of the Organism"; Problem the Third—"The Sphere of Sense and the Logic of Feeling"; Problem the Fourth—"The Sphere of Intellect and Logic of Signs". London: Trübner, 1879. Pp. 500.

"The present volume represents all the remaining manuscript for *Problems of Life and Mind*, so far as it was left by the author in a state that he would have allowed to be fit for publication. Much of it was intended to be re-written, and the whole, if it had undergone his revision, would have received that alternate condensation and expansion sure to be needed in a work which has been of many years' growth, and which treats of a continually growing subject. Some repetitions would have been avoided; many arguments would have been better nourished with illustration; and in the Third Problem there would doubtless have been a more evident order in the succession of chapters, the actual arrangement being partly the result of conjecture. The Fourth Problem, of which the later pages were written hardly more than three weeks before the author's death, is but a fragment; it will perhaps not be felt the less worthy of attention by those readers who have followed his previous works with interest and sympathy."

Man's Moral Nature. An Essay by Richard Maurice Bucke, M.D., Medical Superintendent of the Asylum for the Insane, London, Ontario. London: Trübner, 1879. Pp. 200.

The author very ingeniously attempts to show that the "moral nature," meaning the whole range of properly *emotional* experience, is probably connected with processes in the Great Sympathetic System, as the "intellectual" and the "active" natures are connected with processes of the Cerebro-Spinal System. Suggestions to this effect have been made before by various inquirers, but nobody has supported the position by so careful a consideration of the phenomena of Feeling from the subjective point of view, or has been less disposed to exaggerate the force of the objective evidence (which from the nature of the case, is mainly of a deductive character). The author's view of Feeling as subjectively manifested in the two fundamental couples of opposites—Love-Hate, Faith-Fear (Faith not to be confounded with intellectual Belief), is very strikingly worked out, and so is his view of the Special Emotions as varying combinations of these ground-forms with diverse intellectual representations (which he calls "concepts"). On the physical side of the case, he at all events shows that there can be no sufficient account given of the *expression* of Feeling in relation merely to the cerebro-spinal nervous system. Dr. Bucke writes with a singular earnestness of conviction, and even when his arguments are, as they not seldom are, rather fanciful, the spirit of them does not cease to be scientific. The book helps to shed light on the most obscure and perplexing department of the psychological field.

The "Method," "Meditations," and Selections from the "Principles" of DESCARTES, translated from the Original Texts. Sixth Edition. With a New Introductory Essay, Historical and Critical, by JOHN VEITCH, LL.D., Professor of Logic and Rhetoric in the University of Glasgow. Edinburgh and London: Blackwood, 1879. Pp. clxxxi., 292.

The special feature of this edition is the "longer and fuller discussion on the Philosophy of Descartes, especially with reference to its main historical developments," substituted for the Introduction originally prefixed to the translation of the *Discours de la Méthode*, when that originally appeared by itself in 1850. A considerable part of this new Introduction is devoted to "Hegelian Criticism," including not only a review of Hegel's criticism of Descartes, but a criticism of Hegel himself. "The volume is designed to represent all that is of essential importance in the speculative philosophy of Descartes," and does in truth, by the Translator's judicious selections from the *Principia*, and with the help of his explanatory Notes at the end, come very near to fulfilling that aim. It may still be wished, however, that he would add in a future edition a translation of the whole or part of the *Traité des Passions*, containing so many matters of psychological interest not touched, or less adequately touched, in the concluding part of the *Principia*, and also translations of the short *Règles pour la direction de l'Esprit*, and *Recherche de la verité par la Lumière naturelle*, which give an insight into the true character of Descartes' new way of dealing with scientific and philosophical questions hardly to be gained from the more famous *Méthode* itself.

General Sketch of the History of Pantheism. In Two Volumes. Vol. II. "From the Age of Spinoza to the Commencement of the Nineteenth Century." London: Deacon, 1879. Pp. 347.

The anonymous author has here completed his professedly second-hand exposition of the thought of a number of philosophers who have struck him as more or less, in any way, pantheistic, or who, in some cases, have struck him as *not* pantheistic. His first volume was mentioned in MIND XII. (p. 580). From Spinoza (70 pp.) in the present volume, he passes in succession to Berkeley, Lessing, the Sceptics of the 18th Century (Voltaire, Hume, Kant), Fichte (53 pp.), Hegel (9 pp.), Schelling, to Leibnitz and Schopenhauer (brought together because the one was optimist, the other pessimist). A chapter on "The Philosophic and Scientific aspects of Pantheism," and a "Summary and Conclusion," make up the volume.

Observations et Réflexions sur le Développement de l'Intelligence et du Langage chez les Enfants. Par M. E. EGGER, Membre de l'Institut. (Mémoire lu à l'Académie des Sciences Morales et Politiques). Paris: Picard, 1879. Pp. 72.

This memoir was read and prepared for publication in 1871, but was laid aside until M. Egger's attention was called to it by the signs of interest in the subject which have lately been shown. M. Egger has

considered the growth of children's intelligence as a philologist rather than as a naturalist, so that his point of view is different enough from M. Taine's or Mr. Darwin's to give his work a value of its own apart from the actual addition of new facts which it makes. The statements are confined to the results of personal observation, and there is every appearance of the observation having been careful and skilful.

The time over which M. Egger's work extends is from the first production of voice to the time at which education has generally reached the phase of regular instruction. One of his remarks on early infancy is that children's voices have for some time no individual character, and acquire it with the beginnings of articulation; a thing which, as he says, must have been noticed by medical men, but does not appear to have been recorded.

A good deal of space is given to the fallacies of infantile reasoning produced by casual association or verbal puzzles. Some of the instances are very curious. A little boy could not understand how he was three years and ten months old: "Have I two ages?" he asked. A girl of about the same age, hearing her sister of nine years called Mary, fancied that she too would be called Mary when she was nine years old. The materialism of childish speculation is also illustrated: thus snoring is confounded with dreaming.

The procedure of children coining words and grammatical forms by analogy is noticed, though not quite so fully as might have been expected. Specimens are: *cersonnier* from *cerceau*, after *cordonnier*, &c.; *prendu*, *éteindu*, for *pris*, *éteint*; *nous voirons* for *nous verrons*; *déprocher* = *éloigner*, *délumer* = *éteindre*. Schleicher (quoted by M. Egger) has noticed similar formations in German. In English too they are frequent. The present writer's child, aged 3, turns strong verbs into weak ones, as *hided* for *hidden*, or more often makes hybrid and redundant forms, as *stoled*, *brokend*, *takend*, and (once heard) *spilted*. The late use of pronouns (acquired as a rule at about two years) is also recorded: and an interesting parallel is drawn between the linguistic infirmities of children in their early conversation and those of adult deaf-mutes. Perhaps the oddest childish question reported by M. Egger is this of a little girl about five years old: "Est-ce que les prêtres mangent?" [F. P.]

Ueber die Bedeutung der Einbildungskraft in der Philosophie Kant's und Spinoza's. Von J. Frohschammer, Professor der Philosophie in München. München: Ackermann, 1879. Pp. 172.

The author continues his enterprise of illustrating by historical criticism his own philosophic view as set out in his *Phantasie als Grundprincip des Weltprocesses* (Mind VII. p. 398). In the present work he takes the two philosophers "who have exercised, and still exercise, the most persistent influence on the modern world," and finding that both in their own way have anticipated himself in ascribing a quite special importance to the function of Imagination in all human conceiving, deals at length with this particular aspect of the philosophy of each of them.

IX.—MISCELLANEOUS.

Mr. Edwin Wallace, Fellow of Worcester College, Oxford, is preparing for publication by the Syndics of the Cambridge University Press an edition of Aristotle's *De Anima*. The work, besides containing a Greek text and English translation of the treatise, with critical and explanatory notes, will embrace an introduction on the Psychology of Aristotle: and the editor will particularly seek to maintain the general correctness of the received text against the emendations and criticisms of Torstrik. The work is well advanced, and will probably appear in the course of the present year.

Professor Alfred Goodwin, of University College, London, Fellow of Balliol College, Oxford, is engaged on the preparation of a text-book of Greek Philosophy. The work will deal with Greek Philosophy in its historical development, and embody in its text illustrative quotations translated from each writer treated of, or, where this is impossible, translations of ancient notices of his tenets.

The Education Society has brought its discussions on Prof. Bain's *Education as a Science* to a close, and has arranged the following programme for 1880: (1) Discussions on the Educational Principles of Comenius, Ascham Jacotot, Rousseau, and Pestallozzi: (2) Discussions on papers by foreign Educationalists, viz., "The Effects of the Fatigue caused by mental work in children, Report of an Experiment" by Dr. de Sikorsky, St. Petersburg, "On the Imagination" by Dr. Paul Hohlfeld of Dresden, "The History of Art as a Subject of Education" by Frau K. Göpel, author of *The Illustrated History of Art*, also papers by Baroness v. Marenholtz-Bülow, Prof. Dr. Holzamer, and Prof. Bona Meyer; (3) The Elaboration of a scheme for a Model School (Higher Elementary). The Model School, founded in 1875 by the Ligue de l'Enseignement at Brussels, has been selected by the Committee as being both in principle and execution the best attempt that has hitherto been made in this direction: the scheme, which will be presented to the Society, will be based upon this. The Hon Sec. (Mr. C. H. Lake, Caterham) will be glad to receive any papers or suggestions which can be of assistance to the Society in carrying out this work.

M. Gabriel Compayré, professor of Philosophy at Toulouse, has just published a translation of Prof. Huxley's *Hume* (Paris: Germer Baillière, 1880), with a short Introduction (pp. xxxix.), in which he makes a number of interesting and true observations on Hume's philosophy, and corrects Prof. Huxley's exposition at a few points (*e.g.*, where Hume is charged with supposing the passions to be simple states, because he calls them "impressions," though he had distinguished between "complex" and "simple" impressions). M. Compayré is chiefly concerned to maintain the perfectly serious character of Hume's thinking under its superficial appearance of scepticism. He has good remarks at p. xvii. in defence of Subjective Psychology (as pursued by Hume) against the current attacks made in the interest of a

physiological treatment (having, probably, in view more especially M. Ribot's recent declarations in the introduction to his *Psychologie allemande contemporaine*).

Herr F. Tonnies has begun in the last number of the *Vierteljahrss. für wiss. Philosophie* (III. 4) a series of "Remarks on the Philosophy of Hobbes," based upon original study of MSS. in the British Museum and elsewhere. He explodes in a vigorous fashion the current notion in the histories of philosophy that Hobbes was the disciple of Bacon (a notion which no careful student of Hobbes at first hand could ever have formed), and places Hobbes in his right relation to the more important movement, whether called philosophic or scientific, inaugurated by Galileo. Some new light is thrown on the beginning of Hobbes's philosophic activity about the age of 40, and the attitude he took up some years later to Descartes' physical speculations. Herr Tonnies's assertion that the *Human Nature* and *De corpore Politico* (written, as can be proved, ten years before as one continuous work) were published in 1650 "without Hobbes's consent" is somewhat at variance with the publisher's introductory note to the *Human Nature* on its appearance.

Professor Th. Gomperz of Vienna, whose collection of two papyrus rolls containing fragments of Epicurus's Περι Φύσεως, in the Herculaneum library, led him to maintain that Epicurus was not an Indeterminist, as commonly reported (see Mind III., p. 443)—a view farther strengthened by the discovery of a third transcript of the corresponding parts of the same work (see Mind VII., p. 434)—now announces that he is engaged in the preparation of an edition of all the extant fragments, with the gaps as far as possible restored. Meanwhile he has printed, as a specimen, some three and a half pages containing the passages treating of the doctrine of Will.

J. Versluys has begun to issue at Groningen, in Holland, a series of Dutch translations of works or papers, bearing on Education, to form a "Paedagogische Bibliotheek". Part I. reproduces M. Taine's and Mr. Darwin's well-known articles (in the *Revue Philosophique* and in Mind VI., VII.) on the early development of children; Part II., Locke's *Thoughts concerning Education*; Part III., Fénélon's *Sur l'Éducation des Filles*.

Professor Wundt of Leipsic has just published Vol. I. (*Erkenntnisslehre*) of a comprehensive work on Logic (*Logik: Eine Untersuchung der Principien der Erkenntniss und der Methoden der wissenschaftlichen Forschung*, Stuttgart: Enke. Pp. 397), to be completed in one other volume.

The Journal of Speculative Philosophy.—Vol. XIII., No. 4. Payton Spence—'Time and Space considered as Negations'. W. E. Channing—'Cottage Hymns'. 'Hegel on Romantic Art' (tr.). M. Tuthill—'The Matter and the Method of Thought'. Notes and Discussions. Book Notices.

Revue Philosophique.—IVme Année, No. 10. J. Delbœuf—'Le sommeil et les rêves. I. Aperçus critiques de quelques ouvrages récents'. J. Boussinesq—'Sur le rôle et la legitimité de l'intuition géométrique'. Th. Ribot—'Les mouvements et leur rôle psychologique'. A. Baudouin—'Histoire critique de Vanini' (fin). Analyses et Comptes-rendus. Rev.

des Périod. Correspondance ('Un projet d' Association philosophique'). No. 11. G. Compayré—'Du prétendu scepticisme de Hume'. P. Tannery —'Une théorie de la connaissance mathématique: M. Schmitz-Dumont' (fin). J. Delbœuf—'Le sommeil et les rêves. II. Leurs rapports avec la théorie de la certitude'. Analyses et Comptes-rendus. Rev. des Périod. No. 12. Guyau—'De l'origine des réligions'. B. Perez—'L'éducation du sens esthétique chez le petit enfant'. Notes et Documents (Ch. Richet—'De l'influence du mouvement sur les idées'. J. Delbœuf—'Sur le dédoublement du moi dans les rêves'. C. Henry—'Les manuscrits de Sophie Germain: Documents nouveaux'). Analyses et Comptes-rendus (G. H. Lewes, *The Study of Psychology*, &c.) Correspondance (A. Fouillée —'L'influence de l'idée du libérte sur le déterminisme'). Rev. des Périod.

La Critique Philosophique.—VIIIme Année, Nos. 33-45. F. Pillon —'L'éducation morale des deux sexes' (33); 'La méthode dans l'enseignement primaire (43). 'L'enseignement philosophique dans l'instruction sécondaire (45). L. Ménard—'Un problème d' éducation' (Comment parler à l'enfant de la mort et de la destinée humaine?) (34,41). M. Guyau —'Un problème d' éducation' (36). J. Milsand—'Un problème d' éducation' (37). C. Renouvier—'Les labyrinthes de la métaphysique; Clarke contre Collins. Les arguments déterministes de Collins repris par M. A. Fouillée' (34); 'Le déterminisme socratique chez Descartes' (38); 'Le déterminisme et le libre arbitre. Spinoza et Malebranche, derniers des scolastiques' (43). F. Henneguy—'Un problème d' éducation' (40).

La Filosofia delle Scuole Italiane.—Vol. XX. Disp. 1. T. Mamiani —'Filosofia della realità'. C. Cantoni—'G. M. Bertini'. M. Panizza—'Antropologia: La fisiologia del sistema nervoso nelle sue relazioni coi fatti psichici'. Bibliografia, &c. Disp. 2. G. Barzellotti—'La critica della conoscenza e la metafisica dopo Kant'. L. Ferri—'Osservazioni e considerazioni sopra una bambina; I primi stadii della conoscenza'. M. Panizza—'Antropologia, &c.' (II). F. Ramorino—'Di alcune argomentazioni contenute nel Protagora di Platone'. Bibliografia, &c.

Zeitschrift für Philosophie, &c.—Bd. LXXV. Heft 2. R. Falckenberg—'Ueber den intelligiblen Charakter' (II). J. B. Weiss—'Untersuchungen über F. Schleiermacher's Dialektik' (II. 2). Recensionen (T. Fowler, Bacon's *Novum Organum*, &c.)

Zeitschrift für Völkerpsychologie u. Sprachwissenschaft.—Bd. XI., Heft 3. J. Bona Meyer—'Genie u. Talent: eine psychologische Betrachtung'. H. Steinthal—'Darstellung u. Kritik der Böcklischen Encyklopädie u. Methodologie der Philologie' (II). Beurtheilungen.

Philosophische Monatshefte.—Bd. XV., Heft 9.—H. Vaihinger—'Eine Blattversetzung in Kant's *Prolegomena*'. Recensionen. Literaturbericht. Replik von Prof. W. Schuppe; Duplik von Dr. J. Witte. Bibliographie. Phil. Vorlesungen an den deutschen Hochschulen im Winter-Semester, 1879-80, &c.

Vierteljahrsschrift für wissenschaftliche Philosophie.—Bd. III., Heft. 4. B. Erdmann—'Zur zeitgenössischen Psychologie in Deutschland, mit besonderer Rücksicht auf Th. Ribot, *La Psychologie allemande contemporaine*'. K. Lasswitz—'Die Erneuerung der Atomistik in Deutschland durch Daniel Sennert u. sein Zusammenhang mit Asklepiades von Bithynien'. A. Spir—'Drei Grundfragen des Idealismus: I. Beweis des Idealismus'. F. Tonnies—'Anmerkungen über die Philosophie des Hobbes' (I). W. Schuppe—'Bergmann's *Reine Logik* u. die *Erkenntnisstheoretische Logik* mit ihrem angeblichen Idealismus. Recensionen. Selbstanzeigen.

Correction.—Omitted from Contents of Vol. IV. (issued with No. XVI.), under the head of 'Critical Notices'—

Stewart, J. A.—H. Jackson, *Book V. of the Nicomachean Ethics*, p. 284.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—PHILOSOPHIC DOUBT.

Mr. A. J. Balfour's recent *Defence of Philosophic Doubt* (Macmillan, 1879) is a book for which his antagonists may well feel grateful. I mean nothing equivocal. It is good to have the foundations of belief thoroughly probed by an acute thinker, who says what he thinks as clearly and concisely as possible. Nobody can suppose that the last word has yet been said upon the topics which he discusses, and Mr. Balfour's investigations may stimulate even those readers who do not accept his sceptical conclusions. They may hold that scientific opinions cannot be really injured even by the exposure of contradictions in the statement of the first principles which they are supposed to involve, for a clear definition of first principles is rather the ultimate goal of thought than its primary starting-point. Mr. Balfour himself says that he shares the confidence of men of science in the validity of their conclusions. He considers, indeed, that scientific belief rests upon a "healthy instinct," rather than a strict logical basis; but for many purposes it matters little which name we give to the intellectual process involved.

Mr. Balfour, however, draws another inference, which it seems to be his main purpose to establish. He wishes to put theology on a level with science, and to rebuke the dogmatism of the scientific. Many theological writers have endeavoured in different ways to turn philosophical scepticism to account.

They have tried to parallel their own mysteries by mathematical or philosophical antinomies, and have declared the dogmatism of their opponents to be as irrational as their own. But Mr. Balfour's method is, so far as I know, as original as it is certainly ingenious. It is hardly calculated, as he admits, to appeal to the vulgar, and requires very skilful handling if it is not to be as dangerous to friends as to foes. In any case, whether as a mere intellectual puzzle or a serious defence of theological assumptions, the argument is well worth consideration. I could hardly follow Mr. Balfour over the whole field of controversy without writing a book at least as large as his own. I propose in the following pages to indicate as shortly as I can some of the objections which I should be disposed to develop, if ampler treatment were possible.

Mr. Balfour attacks the various theories of knowledge characteristic of the Empirical, the Transcendental, and the Common Sense schools, and exposes their self-contradictions. He urges that even if we granted the positions which he denies, we could still know little of the world's history; he maintains that, on the same hypothesis, the conclusions drawn by men of science become unintelligible when confronted with their first principles, and he then explains briefly the position of the rival creed. Theological belief rests, according to him, upon a "kind of inward inclination or impulse" (p. 317), which is as valid within its own sphere as the healthy "instinct" of science, or rather is fundamentally of the same nature. The two systems, however, rest "in the main upon separate bases" (p. 322); they may continue to stand "side by side" (p. 320); and if complete conciliation be impossible, it is better to be inconsistent than to destroy either of the conflicting creeds.

Mr. Balfour is content to treat very slightly the constructive part of this theory, and hardly gives materials for detailed criticism. I could adopt much of his language, though to me it bears a rather different meaning. Religion most undoubtedly corresponds to an "inward inclination," or how could religions thrive? The inclination, again, is a "practical cause of belief". That is what the opponents of theology have always been saying. Every belief that has ever existed has some "practical cause," and the difficulty is that, as Mr. Balfour observes, a cause of belief is often very different from a reason for belief. I need give no examples to prove that we often listen to our feelings when we ought to listen to our reason; and we should all agree to condemn the process as illegitimate in any political or judicial question. I should like, therefore, to know how Mr. Balfour distinguishes the impulses which rightfully cause us to believe in a religion, from those impulses which wrongfully cause us to

believe (for example) in the wickedness of an enemy. What kind of criterion can be suggested as to the legitimacy of such impulses? If no criterion can be suggested, we are brought to a scepticism which, if not suicidal, is all-embracing. If knowledge is not essentially contradictory, belief is essentially arbitrary. On the other hand, if any criterion be available, I should like to know how it can be distinguished from that which is available in the case of the scientific belief. Is it not the very same thing?

There is, indeed, an impulse which corresponds to Mr Balfour's description, but it is one which seems to me to have no direct logical value at all. It is simply a name for the emotions which are gratified by any form of religion, and which may be in favour of any form against any other. Their association with any specific creed is not indissoluble, and it at least requires to be proved that they are not capable of being entirely divorced from all theology. Mr. Balfour, by generally identifying religion with theology, seems to assume the impossibility of this divorce; but his opponents would certainly not grant his position. The impulse, according to them, may tell not merely in favour of any theological creed against another, but in favour of positivism as against all theological creeds. The revolt against religions must have the same logical value as the tendency of religions to persist. And, therefore, if the impulse is to be counted at all as a reason for believing, it is as much a reason for believing atheism as theism. The theologian must henceforth be content to say "believe," whilst interpreting it to mean, "believe what you like;" and, therefore, if you like, be an atheist. If he is content with this position, the atheist would probably have little objection to make; and it seems to be the most legitimate result of Mr. Balfour's method. All creeds are to be regarded as on the same basis, and therefore, he seems to think, most people will choose some form of theology.

But I have now to ask whether, upon this showing, any argument can really be made out for placing theology on the same level with scientific belief.

Mr. Balfour speaks as though theology and science formed two different codes of belief, each perfectly coherent, each resting upon its own base—logical or otherwise—and yet partially overlapping, and in the overlapping portions partially inconsistent. The assumption appears to me to be at every point untenable. The great cause of disbelief has not been the conflict between theology and science, but the hopeless and interminable conflicts between theologians themselves. It is not merely that existing religions conflict with each other, that Protestants and Catholics, Christians and Mahommedans, Buddhists and Hindoos, and so

forth, deny each others' claims, and frequently go so far as to pronounce each other to be atheists. This phenomenon might be compatible with the existence of some common element in the different creeds; and, accordingly, the attempt to extract such an element has been the great aim of one large body of religious believers, who have never been able to settle what it was, and whose very attempt has caused them to be denounced as deists and atheists (the two names, it is well known, are synonymous) by the adherents of each particular sect. But this is the natural result of the fact—palpable and obvious—that theology is the common name of many creeds which differ from each other far more radically than some of them do from the scientific creed. Is God a person or the one eternal substance? What do you mean by God? What are his relations to man? Is Free-will inconsistent with the belief in a God or a necessary consequence of that belief? Was Spinoza's creed a form of atheism or the only logical development of theism? If I accept his opinions, I need look for little difficulty with men of science; but, on the other hand, I must abandon all those doctrines as to a personal God and so forth, which, according to some teachers, constitute the very essence of theology. To send me to theology is, therefore, not to refer me to a single impulse, giving clear and consistent results, but to a variety of conflicting impulses which contradict each other on the most vital points, and some of which fall in with scientific teaching upon the very points at which others contradict it. The rational theologian of any shade assails the superstitions of less rational theologians by the same arguments as the man of science; and I do not know by what right all so-called theology is regarded as forming a single group of beliefs radically distinguished from the scientific doctrine which abandons theology.

I do not say this in order to draw at this point the usual contrast between the harmony (real or imaginary) of scientific thinkers and the contradictions of their opponents. My point is at present to deny the validity of the assumption implied in Mr. Balfour's language. If science and theology formed two different creeds, resting on separate bases, accepting different canons of proof, and leading to conflicting conclusions, we might be puzzled to compare their relative validity. But the contention of the "freethinker" (to use Mr. Balfour's phraseology), is different. He would say, as I imagine, that there is only one system of belief, in which precisely the same principles and the same methods are open to all sides. Theology, according to him, is the name of a certain set of beliefs which have been reached by the same processes as the so-called scientific beliefs. It is derived from the guesses made by men in an early stage of in-

tellectual development, and which were not wrong in principle, though they naturally required correction. When a theory had to be framed as to certain phenomena, an anthropomorphic explanation was a natural hypothesis, which turned out to be in many cases incorrect. It was correct when used to explain the movements of a human body: incorrect when applied to the movements of a star. If this be a sound theory, it is natural that theology should gradually melt into science, as we actually find that it does. The gradual abandonment of the erroneous hypothesis, its slow naturalisation or adaptation to scientific teaching by means too familiar for illustration, has for a natural consequence that we are often unable to tell whether in some systems God means anything more than nature or the universe. If the evolution of thought be effected by the slow extenuation of the erroneous assumption, but is always due to essentially identical intellectual operations, the melting of one system into the other is perfectly intelligible. If we assume Mr. Balfour's position of two co-equal and independent powers, there would surely be a broader line of distinction.

The point is one I must try to emphasise. I believe in the unity of knowledge; I do not hold that there are two systems of truths, one scientific and one theological, which can exist side by side in partial independence. If it were so, indeed it would be difficult to understand how they could ever come into collision. The theologian might reign in one sphere and the man of science in the other, and to reconcile them would be simply to point out the distinction of their several spheres. But Mr. Balfour admits what is, of course, obvious, that the two systems contradict each other on some points, even though he tries to extenuate their number and importance. It is therefore important to discover, if possible, what is the nature of the distinction; for our judgment upon his mode of reconcilement must necessarily be affected by our mode of conceiving their mutual relations.

Mr. Balfour divides all our knowledge into four heads—science, metaphysics, ethics, and philosophy. Philosophy, in his sense, is a systematic account of our grounds of belief in any department of knowledge. Science includes the knowledge of all history and matters of fact, or of "phenomena and the relations subsisting between phenomena". In his last chapter he generally uses it in a much narrower and more common sense; but we may admit that all knowledge of phenomena belongs to one and the same class, whether we apply the name science to the whole class, or only to the small part of it, which has been definitely organised into recognised sciences. And, finally, metaphysics includes doctrines of the absolute and the knowledge, real or supposed, of all entities not phenomenal. Where is theology to be classed?

Mr. Balfour puts it under metaphysics; and, of course, theology in the narrowest sense of the word, deals with theories of the absolute and with entities not phenomenal. But it is necessary to add that theology has also a scientific element. Every theological system includes at least a large mass of purely scientific statements, if we understand science in Mr. Balfour's wide sense. Christianity, of course, implies a belief in certain historical facts. It includes statements as to the relations between phenomena. Prayer produces rain—or may produce rain—is as much a scientific statement as the statement that rain is produced by atmospheric currents. Every doctrine about grace, the efficacy of the Sacraments, and so forth, includes psychological theories, true or false, though it may include much more. Could theology be divorced from all relation to "phenomenal" facts, I do not think that men of science, or, indeed, any but a few curious metaphysicians, would trouble their heads about it. Its surpassing interest is primarily due to the fact that it has an important bearing upon facts; in other words, that it forms a part of science, or, in the old phrase, that it is the very Queen of the Sciences, the body of first principles upon which all other truths depend.

So far, then, the distinction seems to me illusory. Theological facts belong to the same order as other facts, and must be proved by evidence of the same kind. It is true that pure theology (if one may use the phrase) is part of metaphysics; but this does not justify Mr. Balfour's distinction. All knowledge implies a metaphysical doctrine, and that is equally true, whether our metaphysical theory admits or excludes the existence of transcendental entities. If I have any knowledge of such entities, I assume it as much in saying that the earth goes round the sun, as in saying that the earth was created 6000 years ago. Thus Mr. Balfour attacks very forcibly the proofs offered by the empirical school for the so-called "Uniformity of Nature". He does not consider it to be proved, or perhaps to be capable of proof, that all events are caused. His scepticism, if established, would have the same bearing upon theology as upon science. If an uncaused event be possible, there can be no ground for believing in a first cause. The theory makes room for the doctrine that all things come from chance. If a plant may have come into existence by chance, it need not have been created. The theologian and the man of science, in short, make precisely the same assumption and use the same logic, though they argue in different directions and at last arrive at different conclusions.

Mr. Balfour, indeed, seems to escape from this conclusion by his distinction between philosophy and metaphysics. His view seems to be (if I rightly understand him), that philosophy explains

the ultimate grounds of belief common to both classes: whilst the man of science uses them to establish theories about phenomena; and the metaphysician (or theologian) uses them to establish theories about his transcendental entities. Now, I cannot draw any such line between philosophy and metaphysics. To me they seem to be merely different aspects of the very same process. A theory about such entities gives at the same time a theory of ultimate grounds of belief; and conversely a theory of the ultimate grounds of belief implies a theory as to the entities—knowable or unknowable. A great part, for example, of Mr. Balfour's philosophic doubt applies to various forms of idealism. If Berkeley's idealism be untenable and contradictory, so is the conception of God which is implied in his theory of perception and causation. When Hume attacked the doctrine of causation accepted by Berkeley, he, at the same time, and by the very same argument, exploded (so far as his attack was successful) the theology bound up with it. With Berkeley God is the causal nexus, which is dissolved by Hume's scepticism. The entities in question, God and the soul and matter, are not objects of which we have independent knowledge, but are names for the conceptions involved in our theory of knowledge—that is, our metaphysics and philosophy coincide.

Mr. Balfour, then, is really attacking the foundations of all knowledge; but I deny that the attack bears equally upon all knowledge. In fact, he must either adopt the suicidal scepticism, which makes knowledge as knowledge impossible, or he must admit that, by means of a "healthy instinct" or otherwise, we can get across this gulf of contradictions. He would, I think, agree that we arrive somehow—though perhaps by a process not strictly logical—at certain tenable beliefs about phenomena. The proposition (let us say) that the earth goes round the sun in a year, remains true, and probably has exactly the same meaning for the Hegelian, the Kantian, and the follower of Hume. They have, it is true, different theories of space and time and matter, but each would accept the same formula, subject to his own interpretation. This is, in fact, the reason or one reason for regarding the sceptical attitude as provisional. We do, in fact, get across the metaphysical gulf, though we cannot define accurately the process by which we have accomplished the feat.

Now (upon my hypothesis) theology and science are in the same position, so far as the preliminary difficulty is concerned. They both make certain assumptions about metaphysics or philosophy, and those assumptions involve precisely the same problems. Till we emerge into the daylight of phenomena, there is no differentiation of the two. The only difference is

this. The man of science, admitting the presence of certain hitherto unsolvable difficulties, does not pronounce upon them. He says, my statement is valid, whatever theory of space and time ultimately commends itself to metaphysicians. The theologian, on the contrary, often insists (for some theologians here, as elsewhere, agree with the ordinary man of science) upon making dogmatic statements in regard to these disputed points. He is not the less dogmatic though he is still in the twilight of absolute uncertainty. He insists upon our believing in the soul, though we cannot settle the theory about the relation of object and subject, which alone gives any real meaning to the word. But now both the scientific man and the theologian emerge into the daylight. They both make statements about facts, or, if you please, about phenomenal facts. So far they are both on precisely the same plane. They have made the same assumptions, have crossed the same gulf, and are discussing the same question. Antecedently to observation, a theory that prayer causes rain is a scientific theory as much as a theory that prayer to a human ruler causes him to act in a given way. But I now proceed to inquire which theory is right. If I can so far surmount scepticism as to admit of any reasoning about facts (and I must do so if I am not to be suicidally sceptical), my reasoning may show the theory to be justified in one case and not justified in the other. Theology is the name of a large number of theories developed from certain opinions as to the explanation of these facts, and Science for other theories developed from a different set of opinions. I may now, therefore, proceed to use the common-sense argument from the coherence and continuity of science, using the phrase in its narrower sense. I find, in fact, that our beliefs as to facts divide themselves into two classes, not in respect of primitive assumptions or methods of reasoning, but inasmuch as part of our theory has proceeded from a mistaken application of certain principles, and part of it from a right application. Either theology or science is simply a right theory applied in the wrong place, and to reason is simply to decide which is the right and which is the wrong application. If, then, I find (as Mr. Balfour agrees) a large body of theories, mutually consistent, constantly verified by independent observers, carrying conviction to all qualified inquirers, and gradually growing and extending without ever contradicting itself; whilst, on the other side, is a large body of mutually contradictory theories, never verified, always treating the same insoluble controversies, and slowly expiring as knowledge expands, I consider that I am justified in assuming the truth of the first set of theories, called collectively science, though now in a narrower sense. By science, in fact, I mean simply that body of truths, whatever it may be, which has been thoroughly tested and

established. There is no difference, except as to the degree of evidence, in the most transitory empirical observation of a given fact, and the most established of those general facts which we call scientific laws. If any body of truth has, in fact, been established, a theory which conflicts with it, and which rests on no such evidence, must at least be provisionally rejected. Whether any theory is really part of science or mere guess, is, of course, a question of facts, often very hard to decide. But believing that some truths have been sufficiently proved, I reject all that conflicts with them in virtue of that very belief; for I need not say that to believe anything is the same as disbelieving its contradictory. That is all the dogmatism to which I can plead guilty. I believe that a railway bridge breaks down when certain forces are brought into action, and that it will break down equally whether they act upon Sunday or Monday. If you call the opposite belief theological, I so far reject theology; but, in my view, it is simply a bit of exploded theory about facts—that is, of false science. The method of reasoning and the principles assumed would be quite accurate if they were applied to a different case. If I were about to cross a drawbridge kept by a fanatical Puritan, who disliked my crossing it on a Sunday, I should argue like the theologian and be very shy of trusting myself upon it, lest he should draw the bolts. But I see no reason for believing that there is an invisible and very powerful Puritan, who will behave in the same way when I cross, say, the bridge at Charing Cross, and therefore I cross it at my ease.

There is, indeed, one point which I must very briefly notice. Mr. Balfour argues in one chapter that the philosophical or metaphysical doctrines of the empirical school, especially the Berkeleyan idealism of Mill, make absolute nonsense of the scientific conclusions. Now, though I admire the ingenuity of his argument, I cannot share Mr. Balfour's own conviction of its conclusiveness. I cannot take the space necessary to argue the point fully. I admit, indeed, that there is a great difficulty in the theory. If we adopt the idealist position, there is a difficulty in saying what is meant by saying that the world, for example, existed before any conscious being perceived its existence. It is just the same difficulty as in saying that there is a shilling in my pocket, when I neither see nor feel it. I cannot answer any such difficulty completely, because I am not prepared with any theory of perception. I am, like Mr. Balfour himself, in a sceptical state of mind on the whole subject, and must be content to wait for the coming philosopher. But I hold this to be one of those metaphysical difficulties which are not fatal to any further advance. I believe that I can attain to truths which

will remain, although their full significance is not yet unfolded. Mr. Balfour urges the absurdity of believing that the appearance of colour can be derived from uncoloured particles. I see no more difficulty in holding this than in holding that a condition of hearing is movement in particles which are not sonorous. It is true that I cannot imagine the particles; for, to imagine them, is to see them in one's mind's eye; and they are, by their nature, not objects of sight. But, then, I reply that neither are they for me objects of belief. I am unfeignedly shy of speaking upon a theory which I very imperfectly understand. So far, however, as I can follow the scientific argument, I should say that the whole theory about molecules comes simply to this. I discover a certain formula purely from observation of the behaviour of visible bodies. I then assume that the same formula may hold good of particles (whatever such particles may be), which it is radically impossible to perceive. So far, I make a mere guess. It is verified by the discovery that, if the analogy holds, certain other phenomena will happen, which are observable, and which I actually do observe. The whole process, then, does not involve any real knowledge of the unperceivable objects; about which, so far as they are unperceivable, I can say nothing. The only result is, that a certain mode of calculation gives true results in regard to what is perceived; and it is quite possible that the imaginary particles may correspond to no reality which I can ever reach by my senses. I believe nothing whatever about the molecules, except that, by assuming them, I can put together a formula which brings out verifiable results. They are mere x's and y's, which may be dropped out of account when the rule is once obtained. But I must be content with indicating an argument which I cannot here pursue.

The above will, perhaps, sufficiently suggest what would be the nature of my answer to a very ingenious retort from the theologian to the man of science, suggested by Mr. Balfour on p. 304. My answer would be briefly, that there are not two systems of belief, but only one; and that theology is simply the unverified and unverifiable part of the system. It is merely bad science. But to explain or justify an objection to theology, it would be necessary to go further and point out in what the illegitimacy of the method precisely consists. I can only touch briefly upon so wide a topic; but I may indicate, at least, a part of the case upon which I should rely.

Theology, then, under one aspect, is either a scientific or a pseudo-scientific theory. To avoid the equivocal word science, it is a theory about phenomenal facts (if, which I doubt, "phenomenal" adds anything to "fact"), though it is also something else. I turn, therefore, to the chapter in which Mr. Balfour assails

most directly the validity of our knowledge of facts; for, in considering what is the nature of the evidence upon which we rely, I shall come to the ground upon which I deny the validity of the theological interpretation. Besides the difficulties about perception and theories of knowledge in general, he takes two points which I may notice: the insufficiency of the proof for the uniformity of nature; and the insufficiency of the evidence which can be adduced (even if that uniformity be granted) for any "historical" facts, that is, I should say, for any facts whatever not immediately perceived. The controversy as to the uniformity of nature is one of those upon which my own mind is not so clear as I could wish, and in regard to which dogmatism is inadmissible. I will, however, say what is, I think, sufficient for the present purpose.

The vague popular senses noticed by Mr. Balfour need not be considered. No scientific reasoner means by professing belief in the doctrine of uniformity to deny the possibility of rare, or astonishing, or even miraculous events, if by miraculous we mean merely an event caused by the interference of some powerful and previously unknown agent. The real difficulty is to interpret the phrase so as to make it differ from the identical proposition, that the same causes must produce the same effects. On the theory of causation derived from Hume, that proposition is not identical; for if the universe be (as Mr. Balfour puts it) comparable to a ballot-box, a vast mass of mutually independent atoms, and by cause and effect we mean merely the occurrence of the same balls in the same order, we cannot establish a necessary connexion, when we have already assumed necessary independence. But if this be an inadequate account of causation; if cause and effect be related "as the convex and the concave sides of a curve," or the cause be only one factor in a given process, the statement merely comes to this, that the same process always admits of the same analysis.

It seems to me that in any case the formula is not so much a postulate, universal or otherwise, as a statement of the process which constitutes all reasoning about facts. The alternative is not assuming some other postulate, but ceasing to think about reality. I may, of course, think of things without thinking of them as caused; but it is a familiar fallacy to confound this with thinking of them as uncaused. I may put together the most heterogeneous and fluctuating assemblage of images; but to ask whether this ideal construction corresponds to any reality is to apply the so-called postulate. I am asking whether the assumption involves any contradiction with perceived or recognised facts; if it does, the reality is impossible; if it does not, it is possible.

If, in fact, the doctrine were a postulate in the ordinary sense, it would be possible to suggest a belief which might be entertained without involving a contradiction, and yet inconsistent with the truth of the postulate. But I do not see how this can be done, except by falling into the confusion just noticed. I can, for example, speak of a dead man coming to life again—a proposition which I will assume to be contrary to all experience. It is easy enough in one sense to imagine this event, even though it corresponds to nothing in the real world. I can picture to myself a dead body, and change the picture to that of a living body. But how is it to be shown that the imagined event is inconsistent with the supposed uniformity of nature? The occurrence of all known symptoms of death, followed by the occurrence of the symptoms of life, is not impossible. All that would be immediately present to my senses, that is, all that I imagine in a case of resurrection, might be actually produced by a change in some unknown conditions. If, indeed, I knew all the conditions of life, I might know the event to be impossible, because I might see that it would involve the presence of certain conditions which I know to be absent. Till I know all the conditions, I can only guess the event to be impossible, however nearly my guess may approach to certainty. It is plain, in any case, that I have not really suggested any event inconsistent with the "postulate" until I have suggested a contradictory event; and, in that case, I certainly cannot believe in it. For, as I cannot produce a contradictory image, it is superfluous to say that there can be nothing corresponding to "it," "it" being a nonentity. Thus, when it is suggested that a body may, for example, have different properties at the pole or in a fixed star, I have nothing to say to the contrary; but I cannot see how the belief is inconsistent with my postulate. The properties of bodies may depend upon their position in the universe; and, so far, they are different bodies.

So far, in short, as my judgment about reality is concerned, it seems to me that the "postulate" falls in with the elementary assumption of all reasoning. It is the assumption that $A = A$. The statement is not superfluous, because I may believe contradictory properties implicitly, though I cannot believe them explicitly and simultaneously. Good logic consists, to a great extent, in bringing these implicit contradictions to my consciousness. But I cannot make a single step of reasoning, except in virtue of this postulate. I assume it, in interpreting a present experience, as in making the simplest inference to the past or future. I classify a particular object as a stone. I assume, that is, that it has the properties of a stone. I infer that it will fall if unsupported. I may, of course, imagine a stone remaining

unsupported in the same place. That merely means that I can see a coloured form remaining unchanged; or, in other words, that I can draw a picture of a stone without drawing the support —which nobody denies. But if I saw such a phenomenon, I should certainly infer either an invisible support or the existence of a new class of things, namely, weightless stones. But there is nothing in this to contradict the postulate. If I could think of the stone as having weight and not falling, there would indeed, be a contradiction; and, therefore, I cannot believe it. If I omit any of the predicates, I am referring the phenomenon to a new class. If I retain them all, I have implicitly applied the postulate.

But this view (which I will not attempt to expand) is fully consistent with an admission of an inherent uncertainty in all statements about facts. It has absolute truth subjectively not objectively, in reference to my ideal constructions not to the world without. My reasoning may fail because I am wrong in my identifications; because I may always have omitted some relevant condition; I am only certain that this (so-called) stone will fall, if it be a stone. It may be something else; I may be under a hallucination. The fact that it is identical to my senses cannot demonstrate its identity in all relations, or the non-existence of an unrecognised force. If I argue as to the behaviour of a balanced needle without any knowledge of magnetism, I shall be liable to the grossest error, by identifying the magnetic needle with other needles identical to my senses. It is possible that the sun may not rise to-morrow. Somebody has maintained, I think, that the material universe is part of a gigantic brain. I cannot prove the contrary, and if there is a brain, there may be a body, and the arm may choose to scratch the head. In that case, nobody can say what would happen to the sun.

I conceive that the process of reasoning as to facts must always be conducted with reference to such principles. I observe, let us suppose, a single coincidence: a black crow or a heavy stone. Nothing, it is urged, can be inferred from such an experience. If I have seen a million black crows or a million heavy stones, I am still not entitled to conclude to a universal proposition, to say that all crows must be black or all stones heavy. That is perfectly true; but it is also true that a single event always demonstrates a possibility. It proves that a black crow or heavy stone is a conceivable phenomenon, for I have conceived it. It even proves further that, for anything I can say, blackness and weight may be essential properties of crows and stones. Every fact, then, is a particular case of various possible laws, for the fact is related to the law as the stationary point to the continuous curve. When a new fact occurs, it falls

in with some of these laws, and shows others to be possible. Though such a process, however far it is continued, can never reach a certainty, it may amply justify a postulate; that is, a belief assumed for purposes of action. Such postulates tend, indeed, to pass into confident beliefs, and often much more rapidly than logic would justify. But considered as determining conduct, such a postulate may be as good as the most demonstrable truth. If, in fact, I am forced to go to the right or the left, and the direction which I take depends upon my believing or not believing a certain proposition, then the slightest presumption in its favour may be as good as a demonstration. If all the arguments derivable from my knowledge of the facts suggest that an enemy is in the path to the left, then I shall go to the right, as much as if I knew absolutely that he was on the left. So if any new phenomenon is sensibly identical with one previously observed, I shall act as if the identity were demonstrated. It is, of course, true that the doubt, which does not alter my decision, will still be allowed for. I shall feel a more or less confident anticipation, though I shall go in the same direction, according to the number, independence, and so forth of the various indications which have guided me in my identification of this with previous cases.

Now, extend this to the most general case. In any particular case, such as that suggested, I suppose that my sphere of action is in some way limited. I am determined to advance, though not determined upon the direction of my advance. The knowledge upon which that last decision rests is only a part of my knowledge—an inference resting on a particular belief, and guided by certain assumed rules. But when we speak of action in general and belief in general, these limitations disappear. I must always act in some way, if it is only to sit still and starve. And I can only extend my beliefs by extending in some direction or other the framework of actually existing belief. The process by which I do this may, of course, be utterly illogical and absurd. A particular belief may drop out of my mind or intrude itself into it in virtue of some mental process which has nothing to do with inference. But in whatever modes it is performed, I must always go through the process of grafting the new opinion into the old, that is, of fitting the new fact into the mental world; and when I ask whether the imagined fact corresponds to the reality this can only be done by applying the postulate. I do not obtain certainty by such means, but I obtain all the certainty possible. I have exhausted all my means of obtaining certainty. In this case, therefore, I distinguish between the belief so reached and an absolute belief, only in the sense that I keep my mind ready to accept a new theory in case

anything should arise to suggest it. But for other purposes the hypothesis is as good as proof.

Thus, for example, I have said that the sun may possibly not rise to-morrow. But as everything which I know, and every inference which I can draw from admitted facts, is consistent with its rising to-morrow, the doubt remains practically inoperative. If some new phenomenon should arise in the heavens tending to suggest an upset in the solar system, such an event would of course change my anticipation. Nor can any one say that such an event will not arise, and therefore my assumption that it will not arise implies no absolute knowledge. But it would be obviously unreasonable to convert this defect of knowledge into a positive reason for doubting; to say, according to the common and most misleading phrase, that there is a "chance" of the sun not rising, and then to convert this chance into a positive cause, like a new phenomenon in the sky. According to some arguments which I have seen, it would be right to say that, as we knew nothing for or against such an occurrence, the chances of its actually occurring are "equal". It is as likely as not that the sun will be smashed to-morrow, and therefore I ought to act upon that doubt, and only make a bet about breakfast. The fallacy would obviously depend upon our tendency to personify "Chance," and so identify ignorance with knowledge.

Without dwelling longer upon a point which I admit to be far from clear, I will proceed to show how, in my opinion, this bears upon one of Mr. Balfour's most ingenious chapters, that upon "Historical Evidence". He says (I epitomise his argument in the simplest way) that all inferences as to past history must involve a knowledge of certain facts and "laws," and of the principle of causation. The problem is how, from such premisses, to deduce the "ordinary version of history" (or rather, I suppose, a trustworthy version of history). We have always, he proceeds, to reason from effects to causes; and here is one source of doubt, since effects may, conceivably at least, be due to different causes. Hence, as he observes, the fact is always intrinsically doubtful; for though we may say, *e.g.*, that a man must die if his head is cut off, we cannot reason backwards and say that his head must have been cut off because he is dead. Even omitting this argument, there is still an immense variety of sceptical doubts. We argue, for example, that flint implements must have been made by men. Other causes are possible, indeed, but the chances are indefinitely in favour of human agency, if only we assume a certain condition of society in the past. But this is again a historical statement, involving new and doubtful inferences from effect to cause, and it is impossible to suggest any mode of estimating the various possibilities. So,

again, if an event is proved by a written document solely, it is always possible that the document may have been forged. How, then, can we settle the chances of forgery, without assuming various propositions as to the state of society or human character at a given period? Therefore, urges Mr. Balfour, "the chances against any particular version of history being true are simply as the number of possible versions of it is to *one*" (p. 56). He adds that it is always equally likely that a given event may be due to the First Cause as to any secondary cause; for, as he argues, it is "clearly impossible to show" that if It produced one set of phenomena directly, It may not have produced another (p. 57). That is, if I understand Mr. Balfour rightly, it is as likely as not that "It" may have written this article. In summing up his argument, Mr. Balfour repeats the same doctrine. We are "driven," he thinks, to the conclusion that if two or more explanations of "the universe are barely possible, they must for anything we can say to the contrary, be equally probable" (p. 283).

Here I will pause for a moment. It must occur to everybody that such an argument would be an awkward substratum for a defender of revealed religion. If accepted, it proves beyond doubt that it is as likely as not that the gospels were forged, for no one can demonstrate an impossibility in that hypothesis. As, moreover, the argument does not throw a doubt (as I understand it) upon our immediate beliefs, it does not amount to a necessarily suicidal scepticism. I may still be justified in believing in the existence of Mr. Balfour, for I may have the pleasure of seeing him, but the chances for or against the existence of some one who lived 2000 years ago must always be equal. However, we must follow truth wherever it leads us, even through apparent paradoxes.

Now, in the first place, let me state one or two considerations which Mr. Balfour would perhaps accept, but which strike me as tending to obviate some of his possible objections. The actual process by which we arrive at most or nearly all our opinions about facts is certainly not one of strict logic. We do not first prove that men have such and such characters at present, that their testimony therefore deserves so much weight; that past ages were in such and such respects different from our own; and then that such and such a given piece of evidence has such and such a value. On the contrary, we imbibe a vast mass of more or less distinct and coherent beliefs from our neighbours; we often attribute to such beliefs a weight altogether disproportionate to the logical evidence; and probably the immense majority of our ordinary assumptions are thus acquired, even if we are far above the average of mankind in reasoning power. All this is a commonplace. And if we desire to confine our beliefs to reason

as much as possible, we are aiming at an ideal which can never be actually attained. The ablest philosopher would probably find upon investigation that a very large mass of opinions, upon which he would unhesitatingly act, are in this sense mere prejudices. All that we can do is to prevent ourselves, as much as possible, from being consciously biassed by anything but reasonable argument, to test what beliefs we can, and to remember that other beliefs should be regarded rather as practical postulates than with confident assurance. So, again, many beliefs which we hold unhesitatingly are clearly not proved to the individual. A boy believes in the existence of Julius Cæsar on the same grounds as he believes in the existence of Jack the Giant-killer. A thorough scholar believes because he has thoroughly examined the evidence; an ordinary man believes chiefly because he knows that the scholar believes. And when we say that the existence of Julius Cæsar is proved, we really mean to express our private belief that there is evidence to be had which has convinced competent inquirers and would convince us. That such beliefs are often quite erroneous needs no proof. Two or three centuries ago people believed in Romulus quite as confidently as in Cæsar. And, so far, I think that such arguments as Mr. Balfour's may be very useful in calling attention to the probable insufficiency of much evidence, the necessity of a closer scrutiny, and the desirability of distinguishing more clearly in our own minds between proofs and guesses. I will only add that, in fact, such beliefs are often not so strong as we suppose. Personally, I am content to believe in Julius Cæsar, but I do not at present see any case in which that belief is likely at all to influence my conduct. I am therefore content to take him for granted, till some scholar disputes his reality, and to leave him, as it were, in a lumber room till I have to bring him out for practical use. If I ever have to establish his existence by my own investigations, I shall very probably receive the same kind of shock as came to Tommy Tulliver and to many another school-boy on first realising the existence of a Latin-talking people. Beliefs of this sort really correspond more accurately than we notice to the deficiency of the evidence actually examined by the individual.

Having said this much, I come now to Mr. Balfour's case. The description which I have recalled of the ordinary process of belief suggests that it is a larger illustration of the simple process. We first accept a whole history—a complex series of beliefs—and see how it will work. We excise bits and add other bits. At every step we make assumptions, which are again verified or modified when we bring other facts into account. We assume testimony to have a certain validity, and men to have

certain characters, more or less, like our own. Each assumption has to be modified in turns, till we find one or other set of assumptions which will bring all the evidence into coherence both with itself and with that core of immediate knowledge round which all other knowledge has of necessity crystallised. Coherence, though not a sufficient condition of accuracy, is a necessary and a very prominent one; and if it includes consistence with our direct knowledge, it is sufficient to establish at least a practical postulate. If all that I know is perfectly consistent with a belief in Julius Cæsar, and if I can suggest no hypothesis, resting upon facts, which is inconsistent with the belief, then I shall act upon the assumption of his existence, and am entitled to come very near an absolute conviction of its reality. Undoubtedly, the process is very cumbrous and tentative; what are postulates in one argument appear as accepted truths in another and conversely; and this difficulty is the cause of the many errors which have prevailed for many ages in such cases. It has taken not one but many generations to unravel the puzzle, and they are still at it.

But here comes the difficulty. I have assumed just now that no hypothesis inconsistent with a given theory can be suggested. Till that is so, we cannot reach even a practical certainty. Is such a case ever possible? To suppose that Julius Cæsar was altogether a fiction (as undoubtedly he has been the centre of many false theories), we have to make a large number of assumptions which are generally regarded as absurd. We have to suppose the forgery not of one but of numerous accounts by independent people; to account for the construction of innumerable stone monuments and coins in many parts of the world; for the origin of many words, customs, and so forth; and last, but not least, for the entire disappearance of the true history for which that of Cæsar has been substituted. Of course, Mr. Balfour and I, as well as all moderately educated people, will reject this assumption; and on the ground which he mentions in the case of flint implements. The "chances," as he says, are infinitely against it. But what right have we to neglect the chance? If any theory be barely possible, he says, all are equally possible. The "chances" against the theory are as the number of possible solutions to one. And I do not see why we should not go further. It is possible, verbally at least, to suggest any number of theories compatible with the non-existence of Julius Cæsar—the forgery of many accounts, a popular hallucination, a modification of the solar myth, the intervention of "It," or perhaps of an invisible, malevolent being who delights in deluding mankind. All these hypotheses are "possible," that is, not self-contradictory. Why am I to reject any, or by what conceivable calculus estimate their relative importance?

Here I must say that the fallacy of the argument (so far as it it fallacious) appears to me to rest upon the misuse—to which I have already referred—of the word Chance. When a mathematician tells us that the chances of a certain event are equal, he may mean one of two things which are radically different. Either he means simply that we know nothing whatever about it—in which case we are not entitled to make any inference whatever about it. Or we know, as in the familiar illustration of heads and tails, a great deal about it. We do not know in the least whether in a given case head or tail will be uppermost. We do know as a matter of experience that, in the long run, they will occur equally often. I say that this is a matter of experience, and I am aware that the statement may be disputed. Still I am quite unable to see how we can by any other hypothesis avoid the absurdity of extracting knowledge from ignorance. If, to recall a previous case, an ignorant man sees a perfectly symmetrical needle balanced on a point, is he justified in arguing that it will direct itself equally often to every point of the compass? If he is, his logic will lead him to a false conclusion. But how can we be certain, prior to experience, that some similar law does not obtain in the case of pence—that the relation of a penny to the earth is not affected in some way by the form of its surface? We guess that it is not so, because we know of no analogy which suggests such a relation, and on experience we find our conjecture verified. But in this case we are starting from an assumption (rightly or wrongly made) that the relation is not affected, and we are really arguing from knowledge, not from blank ignorance.

Thus, again, when Mr. Balfour lays down his theorem about the probability of a given version of history, he says simply this: that we can imagine, say, 20 different cases, each of which would produce the given result. Therefore he says it is 19 to 1 against each particular case. If he has actually summed up all our knowledge in regard to the event, I could agree with him in a sense. But the sense would make the proposition a mere repetition of the former statement. By saying that the chances were 19 to 1, I merely say that I can frame 19 other hypotheses; but I am not a single step further advanced unless I can say, in some sense different from a mere confession of ignorance, that the 20 hypotheses are all entitled to equal weight. Every mathematician—even if his mathematics be of so rudimentary a character as my own—is aware of the difficulty of so counting the various cases as to be sure that they are independent, and entitled to an equal weight in the subsequent calculation. If I know that certain events will, in the long run, happen equally often, I may speak of the equality of the claims represented. If

I know nothing whatever about them except that I can verbally distinguish them, I have no right to a juggle which would convert blank ignorance into a basis of calculations. In all cases, as I believe, where a valid inference is made, we really know something more of the facts than the bare incapacity to see a difference; we have some positive reason for thinking that there is no difference.

If, indeed, we could admit Mr. Balfour's mode of argument without some tacit qualification, we come at once to an absurdity. The bare fact that a thing is not absolutely certain proves that it is indefinitely improbable. There is a margin, if I may say so, of absolute ignorance in any case where there is not perfect knowledge. The very fact that I know nothing about this margin, proves that I may cut it up verbally into any number of divisions; and, as each of them is to count for one and, because we know nothing about it, to count for as much as the known case of possibility, the "chances" against that case may be multiplied as much as we please. This would certainly be a short cut to scepticism; but I deny that there is any real meaning in the words.

In fact, I quite agree that when I have to consider any past or future event, or, indeed, to explain any present event, there is always a difference between my knowledge and absolute certainty. The conviction may approach such certainty as the curve approaches the asymptote, but there is always some room for doubt. I explain by trying to suggest some possible formula under which the event may come, and then to find some basis in the assumed facts to which the formula may become operative. I do so, for example, when, in Mr. Balfour's illustration, I suppose a document to have been forged. Forgery represents a known mode of producing documents, and when a given document is in question, I may always try how this hypothesis will fit the facts. But suppose that I make a hypothesis which has absolutely no relation to the facts already believed, which stands altogether outside of all known series of events, I am merely allowing my imagination to play in a pure vacuum, and simply repeating over again the old admission that there is some uncertainty. I may parcel that uncertainty out into one or fifty different forms, but it can make no difference to the argument.

Further, as soon as I have suggested what I should call a real explanation, a legitimate inference from some facts, I can then estimate the chances—not, of course, that I can find a numerical estimate, except in the very rarest cases, but still a vague estimate, which is after all often quite sufficient, because the chances in favour of one solution may be (as Mr. Balfour says in the case of the flint implements) indefinitely great. So, for example, I

find a printed book. It is rigorously possible that the book may have been made by a man drawing letters out of a bag at random; but I do not suppose that any one would entertain such a suspicion in the case of a coherently intelligible work, and the reason is simply that the chances are indefinitely in favour of the obvious hypothesis that the book was written. By saying that the chances are in its favour, I here point to a wide knowledge of the way in which phenomena are actually produced in this world. I can therefore start from a base of positive knowledge; and the same principle, which I will not try to work out in detail, is exemplified in the case of Julius Cæsar. The hypothesis of a number of forgers existing in different ages and the many other subsidiary hypotheses are so improbable, that is to say, they assume a state of things to which my experience tells me there can be so rarely any faint approximation, that I reject it unhesitatingly. I may not have expressed myself accurately, and I am well aware of the great difficulty of accuracy in such questions; but unless I am substantially right I do not see how we can escape from a suicidal scepticism as to all facts whatever, or get beyond our own immediate sensations.

Mr. Balfour sums up his argument at this point by saying that there are four different suppositions; we may have to decide as to a historical statement, (1) between different sets of phenomena whose laws are known, (2) between "noumenal" and phenomenal causes, (3) between phenomenal causes with known laws and phenomenal causes whose laws are unknown, and (4) and finally, between causes known to have existed and others which (for anything we know to the contrary) may have existed. And here, I must first remark, that the distinction between the noumenal and phenomenal, whatever its value, seems to be entirely irrelevant. I cannot understand that any philosopher who believes in the "noumenal" can ever regard it as a conceivable alternative that an event may arise from noumenal or phenomenal causes. The "noumenal" is that which underlies all phenomena—not something which exists alongside of them. If I say that a document is either forged or genuine, I in each case assume a noumenal cause equally if I ever assume it. It is the unknowable something—unknowable in itself, at any rate—which binds phenomena together, the substance in which all accidents inhere, not an alternative thing which may sometimes take a part as itself phenomenal. If, indeed, we say that a document is produced by a noumenal cause, and another document by a phenomenal, the noumenal becomes phenomenal. And this suggests the real meaning of Mr. Balfour's remark about the First Cause. It is to my mind a clear proof that the explanation, as applied to particular facts, is merely verbal. I

may stop at any point in tracing out a series of events, and, as Mr. Balfour points out, at one point as well as another. If I then assume that things actually started at the point thus selected, I "explain" their beginning by calling it a creation. But the explanation is purely verbal. I first assume a stoppage which is perfectly inconceivable, and in contradiction to the universal postulate. Then, as I must get over the contradiction, I explain the inconceivable event by an inconceivable process. Creation is really nothing but a name for leaving off thinking, and giving to cessation of thought a positive name. It may be illegitimate to talk about the noumenal at all; but at any rate I must not afterwards proceed to treat it as if it were phenomenal, either by introducing it as a single factor in the world, or by making it represent one part of the process in time, and calling the succeeding part phenomenal. To say that a thing is due either to a phenomenal or a noumenal cause, is saying that an explosion is due either to a spark or to a causality. I should propose, therefore, to omit the word altogether from Mr. Balfour's argument, and to cancel the case in which it occurs. And, further, if by the unknown causes in his last case he means causes altogether beyond our sphere, of whose action we have no warrant and no suggestion whatever in existing facts, they represent, I should say, merely that margin of inevitable uncertainty which has no bearing whatever upon our postulate, and only imply the duty of admitting new suggestions whenever they may come within our vision. The other two cases, as I understand them, are often valid. We may be in doubt whether a document is forged or not, and any hitherto unexplained fact may be of such a nature as to suggest the insufficiency of existing formulæ. So long as either case is possible, we should suspend our opinions more or less, and it is the great duty of inquirers to be on the look out for such facts. But, further, there is always in these cases some real means of estimating chances more or less roughly. If any case is completely covered by two alternative formulæ, both based on some known state of facts, we must remain more or less in suspense; but we can at least appeal as a general rule to a kind of inarticulate logical instinct, which roughly evaluates the ease with which either explanation will fit into the existing framework. To show by what means this may be done, and what degree of accuracy the process admits, would be to write a treatise upon inductive logic.

And now I can, finally, return to the comparison between the claims of science and theology. The difficulty turns partly upon the fact that theologians habitually use the word God in two radically different senses, that they confuse the noumenal and

phenomenal, and identify Jehovah with the Absolute and the "Stream of Tendency". Now, in regard to theology, in the more primitive sense, in that which it bears with savages, with children, and with the ignorant part of civilised races, the theory that there are one or more invisible beings of great power who take a part in the production of phenomenal events,—my answer to Mr. Balfour would be that this is a theory which has been proved to be either inaccurate or superfluous. I do not say proved by "science," but proved by the general action of the intellect. It is proved—that is, as much as anything can be proved—that we never find intelligent action except where we find a brain, or at least a nervous system. I reject any doctrine inconsistent with this theory, simply because I can see no basis for it in facts or in any of those general statements of facts which we call laws. Whether Catholic saints, or Pagan gods, or mere savage fetiches, or the "spirits" of mediums are assumed to exist, there is no proof of their existence; they "explain" nothing which cannot be better explained without; and, moreover, it is easy to account for the origin of the error. It is simply an application of a scientific method in the wrong place, a mistaken grouping of facts which have been proved to be different in character. I may, of course, be wrong in this opinion, but its grounds are as familiar to Mr. Balfour as to myself, and are equally valid upon any theory which admits of our obtaining knowledge of phenomena at all.

But the non-existence of such beings is not proved and cannot be proved. I fully grant it. Only the non-proof is in this case as good as positive disproof. Thus, for example, I suppose thunder to be due to the action of a god throwing bolts from the sky, or the planets to be moved by angels, which is a very natural guess in an early stage of inquiry. Now, this is to assert that the planets and thunder will exemplify the same rule as the projection of missiles and the guidance of chariots by human beings. A more accurate observation shows this to be a mistake; that thunder arises under certain electrical conditions, and the planets revolve regularly in ellipses. This certainly does not prove that there are no beings throwing thunderbolts at the right moment or moving the planets. But it proves that, if there are such beings, their existence is absolutely irrelevant to me. My previsions will not be affected in one way or other by supposing them to be there. They are for all practical purposes, as if they were not. They are relegated to that region which Mr. Lewes called "metempirical," for, by the assumption, no test can possibly be devised for saying whether they do or do not exist. Their existence, that is, cannot be verified. It is then needless to take it into account.

Mr. Balfour says truly that the simplicity of a rule is not a sufficient ground for accepting it. This is true in the general statement, but there is a particular case in which it is amply sufficient. That is the case, in which two rules always give the same result, but one involves a complex process of self-correction so as to justify the other. I may say, for example, that a body always moves in a straight line, or I may say that it always moves upon the outline of some complicated curve, which again always revolves round a moving point in some equally complex fashion. I may (from a purely geometrical point of view) adopt either the Ptolemaic or the Copernican hypothesis, and always bring my planets back into the true path by a complex series of epicycles. And similarly I may say that the planets move in an ellipse, or that a spirit moves them but always keeps them in the same line as the simpler theory prescribes. Obviously, in this latter case, the spirit is a mere superfluity. I may make as many such hypotheses as I please, but they have no relation to any facts, and give a merely illusory appearance of knowledge. Either the spirit is a common quantity which may be left out of account on both sides of an equation, or he is a being of whom I falsely imagine myself to have some independent knowledge. In either case, we are better without him.

And this, as it seems to me, is the origin of the other form into which theology develops. You still retain your invisible being, but you decline to make any specific inference from his existence. He retains a nominal existence upon the strength of a tacit engagement not to interfere with any particular event. He is gradually rarefied into a transcendental or noumenal being, whose existence may be necessary to everything, but who exerts (if I may say so) no differential influence. He does not affect one series of events more than another. Whether we are bound to believe in such an entity, whether there may be some universal substance of the Spinozistic kind, is no doubt a very interesting as well as an exceedingly complex question. I only say that such a being cannot possibly interfere in any way with scientific laws, which deal with phenomena. It is a mere sophistry which first calls upon me to believe in this universal substance and then proceeds to infer some particular action on a given event or a given part of the universe. Such a belief is fully as much opposed to miracles, the efficacy of prayer, the infallibility of a church, and so forth, as the belief which would take the hypothesis to be superfluous. And therefore, though I do not deny the legitimacy of this doctrine, I think I am entitled, whether I accept or deny it, to reject any theory professedly founded upon it, and yet professing to justify belief in a particular invisible agent. The terms are shifted by a palpably

contradictory artifice. The more I believe in the God of Spinoza, the less I believe in the pomp of theories about "supernatural" interferences, which Mr. Balfour seems generally to understand by religion. Briefly, my argument is, that theology is either a scientific theory, in which case any mode of comparing between different scientific theories is equally applicable to deciding upon this theory, and, if there be no method, we are driven to "suicidal" scepticism—to the negation of belief as belief; or theology must escape by retiring altogether to the metempirical world, where it can have no relation to any scientific doctrine, that is, on Mr. Balfour's acceptation of the word—no relation to any particular facts.

LESLIE STEPHEN.

II.—PLEASURE OF VISUAL FORM.

IT is often said that the pleasure of form as contrasted with that of colour is an intellectual pleasure arising from the perception of relations (unity in variety, proportion, &c.). In a sense this is true, for, as I hope to show in the course of this essay, the appreciation of form as compared with the enjoyment of colour is saturated, so to speak, with the more refined sort of intellectual activity. But the fact that one of the arts of form, namely, outline drawing, dispenses not only with the pleasure of colour, but also with that of light and shade, suggests that the pleasure of visual form includes a sensuous element as well as an intellectual. It will be my special aim in this paper to bring out this somewhat neglected factor in visual gratification, and to indicate, so far as it is possible, its importance among the several factors, which together compose what we call beauty of form.

In pursuing this inquiry, it will be best to disregard the sensuous enjoyment of light and shade. For our present purpose, differences of light and shade are merely means of appreciating form. Again, it will be advisable to include all varieties of form as determined by the three dimensions of space. It is true that beauty of form, so far as it rests on purely visual feelings, is largely that of surface-relations or of space in two dimensions. Yet it will be found to be practically impossible to treat of this apart from that other kind of beauty of form which embraces the charm of distance and perspective, and the characteristic attractiveness of solid shapes. As to the order of treatment, I

shall set out with the elements of pleasure which are obviously direct, that is, arise from the activity of the visual organ, and trace the process of building up a more complex intellectual gratification on these. After that I shall pass to the indirect or associated elements of enjoyment. The simplest kind of visual appreciation of form is that of linear relations. For reasons to be spoken of presently, a straight line is the natural element of visible form, and the development of the visual perception of form (regarded as independent of that of the tactual) proceeds by a kind of synthesis of linear elements. We may therefore confine ourselves for the present to this kind of form-intuition.

There are two ways of perceiving a line: either the eye may move along it, and appreciate its direction, length, &c., by the aid of movement; or it may fix the line, and estimate it by means of the impressions it simultaneously makes on different retinal elements. I shall assume here what is held by German writers like Lotze, Helmholtz, and Wundt, as well as by most English psychologists, that the former is the earlier method. This, then, is the simple experience into which we have first to look for the germ of the enjoyment of form.

SENSUOUS FACTOR.

We must imagine the eye, and first of all one eye apart from the other, moving as it now does, but having, instead of an extended retina, a single sensitive point at the centre of the yellow spot, which is successively directed to different points in the outline of an object, with no other change of feeling than that which is connected with the movement itself.[1] It is plain that this experience will exactly resemble that of following a moving object, as a shooting star, with the single difference that in the former case the rapidity of movement will be a matter of choice. In order to understand the kind of æsthetic experience which the eye would have under these circumstances, it is necessary to say a word or two about its mode of action. I shall suppose that the reader is acquainted with the general features of the mechanism of ocular movement, and content myself with specifying one or two facts having an important bearing on our subject.

First of all, then, I would remind the reader that setting out from the natural or "primary" position in which the axis or centre of vision is directed to a point immediately in front of it, the eye is able to follow any line in the supposedly flat field of vision without a great expenditure of muscular energy, and with

[1] This supposition is not really conceivable, since a plurality of retinal elements is necessary to the eye's *following* any line.

a uniform action of one or more muscles.[1] In other words, it is the simple and normal mode of visual action to describe a movement which answers to a straight line on the flat field. But though all rectilinear movements from this primary position are normal ones, some are easier than others. Thus, while horizontal movements only require the action of one muscle, vertical movements involve two, and oblique movements three.[2] Movements far away from the primary position to points near the periphery of the field clearly involve a greater degree of muscular expenditure, the muscles in this case being contracted to their extreme limit. Further, it is noteworthy that in these outer regions of the field, movements are no longer executed with the same simplicity. Thus, if the eye follows a horizontal line lying high in the plane of vision, more than one muscle is involved. To sum up: the eye, owing to the laws of its mechanism, follows a line much more easily in the central than in the peripheral parts of the field, and in the central parts it follows a vertical line more easily than an oblique, and a horizontal more easily than a vertical.

It would seem to follow from these conditions of facile movement in monocular vision, that in the case of binocular vision movements with parallel axes will be easier than movements with convergent axes. And this is proved by observation, for, as Wundt points out, infants instinctively move their eyes in the former way. Combined movements with convergent axes constantly involve an extra element of muscular tension, namely, that which is required to counteract the natural tendency to parallelism.[3] For the rest, it is to be noted that with respect to "movements of convergence" (which cause the axes to approach one another, or *vice versa*), the symmetrical movements, which would be executed in following a receding line in the medium plane of the body, have so far a natural superiority over asymmetrical ones, that in the former case the movements of the two eyes are exactly similar, in the latter case not so. The greater sense of ease which accompanies such symmetrical movements is probably explained, in part at least, by the constant need of executing such movements in passing the eyes from near to distant points lying in this medium plane.

[1] In this primary position the tension of the antagonist muscles is just balanced, and movement involves the first and easiest stages of contraction and relaxation.

[2] See Wundt, *Physiologische Psychologie*, pp. 536-539.

[3] It is to be added, however, that in the case of movements with convergent axes, directed to a point immediately in front of the two eyes, the contrast between horizontal and vertical movements pointed out in the case of monocular vision, seems to be somewhat modified, though hardly obliterated.

Let us now pass to the subjective aspects of ocular movement. Although there is still a good deal of uncertainty respecting the exact composition of the feelings of movement, it may be taken as fairly proved that they include an active element or "feeling of innervation," which is correlated with the central excitation of motor fibres, and a passive element or tactual sensation which is connected with a reflex excitation of sensory fibres, consequent on certain differences in the tensions and mutual pressure of various parts of the skin which result from the movement.[1] The recognition of this two-fold element in the feelings of movement may help us in understanding the pleasures of ocular movement.

It will, I think, be admitted as a truth, which is both borne out by direct experience and deducible from more general principles, that every movement of an organ is accompanied by at least a slightly pleasurable feeling, provided it has an appreciable duration and rapidity, and on the other hand is not excessive, whether as violently rapid, or as unduly prolonged in time, by repetition, or, finally, as unduly prolonged in space or carried beyond the limits of ordinary and easy muscular contraction. The movements of the eye will be found to illustrate this law, though, owing to the small calibre of the ocular muscles, both the enjoyment and the fatigue attending them are apt to seem insignificant quantities. The pleasures of ocular movement are thus confined within definite limits, namely, a certain duration of a certain velocity of movement over the central part of the field of vision. Further, movements involving a higher degree of muscular expenditure grow fatiguing sooner than others, as we may see in the case of following the outline of very near objects with convergent axes. Finally, certain combinations of muscular action give rise to fatigue sooner than others, *e.g.*, those necessary to oblique movement sooner than those involved in vertical or horizontal. The reason of this may be not so much the larger number of muscular factors as the relative infrequency of the combination. We have in a general way much more need to execute vertical and horizontal movements than oblique ones, height and lateral distance being the two most important dimensions; and this would tend to make the former easier and less rapidly fatiguing. For a like reason, the superior ease of horizontal movements may be referred in part to the greater need in general of attending to lateral relations of distance than to vertical ones.

Within these limits of pleasurable ocular movement we may

[1] It is probable that this passive element includes the mental concomitant of an excitation of the sensory fibres which are known to run to the muscles themselves.

find a difference in the quality of the enjoyment, according as the movement is energetic (though not excessively so) or comparatively restful. In the first case the feeling is of a more active and stimulating quality, and approaches in character the sense of power which we experience when we employ the larger muscles of the body. In the second case it is more passive and allied to sensation proper. It may be thrown out as a conjecture that the former mode of pleasurable feeling is connected with the excitation of the motor fibres, whereas the latter consists mainly of the tactual and other sensations already referred to. We may, perhaps, conceive that when the motor innervation reaches a certain degree of intensity, its mental correlative becomes the predominant feeling; but that when it falls below this point, the passive sensations come to the surface of consciousness, so to speak, and give the dominant character to the feeling. On the whole, the gentler forms of ocular movement yield richer enjoyment than the more energetic. The muscles of the eye hardly seem to be of a sufficient calibre to supply the full consciousness of active force, which is a concomitant of the energetic action of the larger muscles of the body. Hence it may be said that the quieter forms of motor enjoyment are preferred by the eye.

This difference in the quality of the agreeable feelings of ocular movement is best seen in comparing slow and rapid movements, as in following the progress of a rocket in its early and later stages. As Professor Bain remarks, rapid visible movements are stimulating, while slow ones are more voluptuous and allied to the richer varieties of passive sensation. In following straight lines, and in tracing the outlines of objects, the eye has, it is obvious, a choice out of an indefinite number of velocities of movement. It is probable, for the reason just given, that under these circumstances it usually prefers a slow to an excitingly rapid species of movement.[1]

For a similar reason those directions of ocular movement which answer to easy and habitual muscular action, have more of a pleasurable character than those which soon approach the threshold of fatigue. Thus, a horizontal line is, as a rule, in itself, and apart from any extraneous consideration, more enjoyable, because more restful, than a vertical. Let the reader compare the feelings he has in looking at architecture, in which the vertical direction predominates, and at the approximately horizontal lines of a flat landscape. A somewhat analogous difference exists between movements of the two eyes with strongly

[1] A certain rapidity is no doubt made natural by the need of visually construing objects as wholes.

converging and with parallel axes. The sweet repose of distance arises in part from this comparatively relaxed form of muscular activity.

So much as to the pleasure of single ocular movement. Let us now see how a pleasant succession of movements is to be secured. The conditions of agreeable sequence of movement seem to be the combination of the refreshing and stimulating element of change with an element of smoothness or ease of transition. Change of movement is, of course, necessitated by the universal condition of mental life, and variety is the very essence of all æsthetic feeling. On the other hand, a chain of varied movements may be smooth and agreeable, or jerky and harsh, and this difference is related to the innate mechanical conditions of movement, and to the effects of habit.

Change of movement may most easily be secured by a variation either of velocity or of direction.[1] One and the same movement may vary in velocity, as in watching the ascent or descent of a projectile thrown up vertically. So different movements may present a difference of velocity as in the sequences of a ballet. Such contrasts plainly answer to the most favourable mode of expending motor energy. Again, our movement may be followed by another of different direction; that is to say, one that involves the action of fresh muscular elements, or a change in the relative amounts of action of two or more combining muscles. All complicated movements of objects and all arrangements of lines in the figures of bodies supply such variation in abundance.

So much as to change of element. Let us now pass to the other condition of agreeable sequence, namely, smoothness. The first and most obvious way of realising such smoothness is by reducing the degree of change or contrast to a minimum. In this way we get a gradation of movement either in respect of velocity or of direction.

Gradation in direction or velocity, like gradation in shade of colour or pitch of tone, is attended by a peculiarly agreeable feeling. One and the same movement may exhibit a gradual rise and fall of velocity, and it is probable that this is the form of movement naturally produced by all muscular contraction. Gradation in direction, which is at the basis of all curvilinear movements, depends on a gradual alteration in the relative degrees of activity of two or more muscles, and so corresponds to gradation in colour or tone, which is supposed to rest on a continual increase of activity in certain nerve-elements, and de-

[1] Change of duration and extent of movement will be best spoken of later on.

crease in others. A mode of gradation somewhat similar to that in direction is experienced in symmetrical movements of convergence, and especially in moving the axes from a near to a distant point, and so gradually relaxing the tension due to convergence.[1]

This mode of motor enjoyment is realised when standing in the middle of a building or an avenue of trees, and tracing an imaginary central receding line; and it is noticeable that we naturally place ourselves in the position and execute this kind of movement whenever we wish to appreciate the effect of perspective. It may be added that a union of gradation of velocity with that of duration, as in tracing the path of a projectile across the field of vision, affords the eye its richest form of motor delight.

A graduated series of movements allows of the least exciting degree of the feeling of variety. If a more powerful effect of change is desired, the element of smoothness must be looked for in another way. A succession of different movements has a certain degree of smoothness if they are continuous and free from sudden pauses and jerkiness. This can only happen if the movement is continuous in time, and, what is implied in this, in space—that is to say, the second movement must be one which can be commenced in that position of the eye in which the first has left it. Where this is not the case, there must be a "spring" of the eye to the new starting-point, which counts as an appreciable element of roughness or unevenness.

A higher degree of fluency is attained when the muscles, successively employed, are organically connected one with another, whether by some innate arrangement or by the influence of habit. This applies more especially to the action of the antagonists. A movement of the eyes to the left of the field produces a tendency in the antagonists to pull them back again. Hence the natural disposition to trace a line forwards and backwards. Assuming the primary position to be the natural one, we may argue that any movement of the axis of vision from the centre of the field excites a tendency to a corresponding movement of return to the central point of repose. Any chain of visible movements, as those of a ballet, and any arrangement of lines will gratify the eye in proportion to the number of such balancing actions of the ocular muscles which it includes.

It is only one step more to say that a full degree of fluency of movement implies a simple rhythmic order in the successive movements. The muscles of the eye being symmetrically

[1] A rectilinear movement of the eye away from and back to the primary position, may be said to afford a faint feeling of gradation, analogous to that experienced in movements of convergence.

formed, it follows that the action of any one will be compensated by the action of another of the same duration (the velocity being supposed to be the same). In this way a certain amount of rhythmic or equal time-order is rendered agreeable by an innate organic arrangement, and quite independently of any conscious perception of time-relations.

And here we reach the limit of what can be called the organic factor of sensuous gratification in ocular movement, and trench on the properly intellectual enjoyment of perceived relations. The perception of proportion would no doubt be possible if the eyes were what we have so far imagined them to be, incapable of simultaneous impressions. The moving eye, like the moving limb, can appreciate relations of duration and distance or time-rhythm and space-rhythm within certain limits. Yet such a co-ordination of successive elements would be certainly inferior to that of the actual eye, with its capability of simultaneous impressions. It would probably be inferior to the ear's perception of measure. Hence we shall do best to treat of the visual sense of proportion and equality of magnitudes in connexion with that more complex organ with which nature has actually endowed us. To the consideration of this higher kind of perception let us now pass.

INTELLECTUAL FACTOR.

In endowing our imaginary eye with an extended retina which allows of simultaneous perception of form-relations, we do not get rid of the elementary experiences of movement first dwelt on: we only transform them somewhat. There is good reason to think that actual movement enters into our customary perception even of the smaller forms much more than is generally supposed. It may be added that what we call a simultaneous perception of form is often, as I shall have occasion to show presently, a sequence of simultaneous perceptions. But more than this, one may now contend, with a fair degree of confidence, that even in the perception of form by the resting eye, motor elements are essential ingredients, however much they may be disguised.

I need not here expound or defend the hypothesis of local signs put forth by Lotze, and accepted with certain modifications by Helmholtz and Wundt. Readers of MIND may be supposed to be sufficiently familiar with the theory, and the kind of proof of which it is susceptible. My concern here is to trace some of the æsthetic consequences of this hypothesis. It at once follows from this theory that the resting eye's perception of form consists of a mass of motor feeling ideally represented. In other

words, it is made up of a number of imperfectly distinguished imaginations of movement in different directions, &c. And these representative feelings are very various in character, since we are vaguely aware that any fixed line, for example, offers a choice of movement in two directions, and of an indefinite number of velocities. Now, if we conceive that the feelings of movement thus represented in a confused aggregate are distinctly pleasurable however faint, it must follow that such a condition, of what I may call the motor imagination, will be a highly agreeable one. It will involve a vague consciousness of a wealth of motor experience, and a large area ef selection. It has been said that the possibilities of enjoyment in valuable possessions, as wealth and friends, often count more than the amount of actual enjoyment we are ever likely to get out of them. This remark may apply to that recognition of the possibilities of pleasurable movement which every beautiful form supplies to the resting eye.

The capability of simultaneous local recognition by the eye would seem in this way greatly to enrich its enjoyment of form. Our appreciation of a beautiful line includes a transition from a state of actual movement with its definite motor feelings to a state of actual repose with the imagination of movement only and of relatively indefinite feelings of movement.

To verify these deductions, it would be necessary to show that all agreeable forms up to the most beautiful do answer to pleasurable ocular movements. In a general way this will be found to be so. A beautiful figure is one which selects such elements of form, together with combinations of these, as supply the eye with the more agreeable varieties of motor experience already spoken of. The selection of curved lines, the preference for horizontal lines (which seems to be exemplified in the feeling for bilateral symmetry), the taste for continuous forms or contour arrangements, for the grouping of parts about a centre and for symmetrical balance (which answer no less to the natural conditions of easy movement than they do to the arrangements of the retina itself),—all this seems to show how closely beauty of form is conditioned by the laws of agreeable movement.

At the same time, what we call a beautiful form is sometimes ready to sacrifice this pleasure of movement; and it does so just because it can command another kind of gratification—namely, an intellectual pleasure in the recognition of relations. To this new factor we may now pass. I have already remarked that the moving eye, capable of successive experiences only, would not attain to any very complex perception of relations of parts. The capability shown in the delicate discrimination of shades of direction and distance, and still more in the co-ordination of

manifold details under some aspect of unity, seems to be inseparably bound up with the fact of simultaneous retinal impression. A word or two will perhaps make this clearer.

The substitution of simultaneous retinal perception of form for successive perception has the effect of bringing together the terms of the relations of variety and contrast, unity and similarity, under what is approximately one act of attention. If we watch the movements of a painter's hand as he draws the outline of a human figure on a canvas, our eye may attain a rough perception of the successive directions and distances; but how vague will this perception be as compared with that which we instantaneously obtain when the artist moves away from his canvas, and shows us these as parts of a permanent co-existent whole! In the former case we had to bring together by the aid of memory a number of impressions occupying some appreciable time: in the latter these were presented to us in one and the same instant. It must follow, then, that the perception of all relations, whether of dissimilarity or similarity, will under the circumstances become more definite and more exact.

Nor is this all the gain. The addition of simultaneous retinal appreciation introduces a new and finer standard in estimating the elements of form themselves. In the case of two lines, for example, which are nearly equal, or of two lines which are nearly parallel, the discrimination of magnitude and direction is finer when the lines are brought together and simultaneously perceived by help of the retinal impressions than when they are so situated that they (or their distances from one another) have to be successively estimated by the moving eye.[1] It may be thought that these more delicate estimates are of more importance in science than in art; yet even in the latter the less obtrusive charm of form, more particularly that of the human face, involves this finer retinal appreciation. It may be added that even when the former is too large to be easily taken in by the eye at rest, the retinal capability of simultaneous perception greatly assists in the clearer and more exact appreciation of relations. In estimating, for example, the symmetry of a column, of a pyramid or of a human figure, the eye need not pass over the whole of the contour. It is sufficient if it describe a path answering to the axis of the figure; for in this case the perfect equality of any two opposed parts will be estimated by

[1] This is not inconsistent with the supposition that the retinal estimation of direction and magnitude may in the last instance be traceable to feelings of movement. One may suppose that the retinal judgment represents the average and constant as opposed to the particular and variable motor experience.

retinal perception, and the whole intuition of form will then consist of a series of simultaneous perceptions.

Having thus determined what means of appreciating formal elements and relations are at the command of the eye, our next inquiry will naturally be—What modes of æsthetic intuition, in other words, what intellectual perceptions of pleasing and beautiful relations of form, are possible by help of these means? Fortunately, this side of the subject has been pretty fully investigated already, and I shall be able to pass it over with a very few words.

I here assume, what is agreed on by most writers that beauty of form, so far as it is independent of sensuous pleasure on the one hand and pleasures of association and suggestion on the other, is resolvable into the presence of a certain order among manifold details, which order is commonly spoken of as unity in variety.[1] With respect, first of all, to the way in which the element of variety and contrast presents itself in visible form, a word or two will suffice. Direction and magnitude of lines, degree of change of direction, whether appearing as an angle or as a curve, each offer a field for the perception of difference and contrast. And each figure formed by a single arrangement of lines, may, in its turn, become, either in its form or simply in its magnitude, an element of variety in a larger scheme. Gradation, in respect both of simple direction or change of direction, as in gradually expanding curves, and of magnitude of line and form, seems to play a prominent part in the arts of form. It is worth noting that these elements of variety may be *indefinitely* present to the mind, as in the perception of all relation of distance and direction between points which are not connected by lines. The appreciation of superficial and solid, as distinguished from linear, form clearly involves a countless number of such less definite elements of visual perception.

The study of the various modes of securing a pleasing unity in visual form is a little more intricate. Speaking roughly, one may say that there are three distinguishable moments or aspects in this unity—namely, continuity of parts one with another, their common correlation with some one dominant element, which

[1] Mr. Gurney, in his highly suggestive article on the "Relations of Reason to Beauty" (MIND XVI.) seems to dispute this when he says (p. 488) "unity under variety is a characteristic, or rather is the definition, of all form, not specially of beautiful form". There is, however, I suspect, no real contradiction between us. Mr. Gurney uses the term beauty in a narrower sense than I do. To me all form, as defined by Mr. Gurney, is *qua* form pleasurable, and its æsthetic value (as Fechner has so well shown), increases within certain limits with the number of distinctly recognisable points of diversity and unity.

is usually the central one, and, finally, their similarity and equality. A word or two must suffice in illustrating each of these aspects.

(1) We have found a reason for introducing continuity of lines into pleasing form in the nature of ocular movement. Over and above the feeling of smooth transition thus given, a continuous as opposed to a broken arrangement is at once felt to be a unity. The movement of the eye around a contour to the point from which it set out, yields a peculiar feeling of gratification which may be called a sense of completeness.[1] The special æsthetic value of contour is seen in the custom of accentuating it in decorative designs by means of ornamental appendages. It is evident that this feeling for the æsthetic value of continuity in form will be developed by experience, which leads us to look on outline as the essential factor in the unity of objects.

(2) Another mode of unity in form closely related to continuity is common connexion with one principal element of form, and more particularly with a dominant central feature. For the resting eye, as for the moving, the arrangement of parts about a centre has a special value as supplying the most natural mode of percipient activity. Owing, indeed, to the structure of the retina, the centre of an object or group of objects is naturally raised to a place of honour.[2] The eye is instinctively disposed to connect all parts of a design with some central element, and the recognition of such a common connexion with a centre gives to a design the artistic charm of unity. The most natural central element is, of course, a point, and there are many pleasing forms both in nature and in art which owe a part of their æsthetic value to the presence of such a connecting point. The circular and stellar or radiating forms, the scroll or volute, clearly have this central dominating factor. In many cases, however, the central element is a line or even some simple figure. Thus, all arrangements about an axis, as the forms of trees, flowers, and stems, and all like patterns, are pleasing. In decorative art, again,

[1] This is strictly analogous to the satisfaction which the ear derives from melodic movement, setting out from a given note (the tonic) and returning to the same.

[2] It is a distinguishing peculiarity of movements of the eye from the primary position outwards, that they are attended by no rolling of the eye about the axis of vision. As a consequence of this, in tracing lines which radiate from the centre of the field (exactly opposite to it), it continues to receive the image of the line on the same retinal meridian or series of retinal points, so that at any two successive moments the images partly overlap. This fact speaks for the supreme importance of estimating direction and distance in relation to the centre. It may be added that Mr. Ruskin recognises the principle here illustrated under his Laws of Principality and Radiation.

a central feature is frequently supplied in the shape of some small circle or rectilinear figure.

(3) The third aspect of unity, similarity of parts, includes likeness of direction, equality of magnitudes, proportion, &c. All pleasing forms present similarities of direction, simple and compound, and the characteristic beauty of many forms, both in nature and in art, is traceable in part to the prominence of some one element of direction. Thus the various charm of the forms of cedar and birch among trees, and of the Romanesque and Gothic among architectural styles, is partly due to the predominance of some characteristic feature, as the horizontal or drooping line, the rounded or pointed arch.

The sense of equality enters into geometry much more prominently than into visual art; yet it is not excluded from the latter, it only appears in a more disguised way. All equalities of magnitude among lines, surfaces, &c., are, to speak with Fechner, above the threshold of enjoyment, and the study of art in all its branches shows that this enjoyment is an appreciable quantity. Among the equalities to which the æsthetically cultivated eye is specially susceptible are those in change of direction, whether angular or curvilinear. In all regular rectilinear figures equality of angle is appreciated as well as that of linear magnitude. The moderate beauty of uniform curves and of undulating lines rests in part on a feeling for this factor of regular and equal change.

That relations of proportion enter into beautiful form, is allowed by all. A technically trained eye may recognise, and perhaps enjoy, simple numerical ratios among magnitudes in lines, &c., but this factor does not appear to enter, in a conscious way at least, into ordinary æsthetic appreciation of form. We hardly experience any addition of enjoyment in learning that the ratio of the axes of a pleasing oval is 2 : 1. So far as conscious reflection can tell us, our enjoyment of proportion rests on a vague estimation of one magnitude in relation to another. But though this relation is not numerically appreciated, it is very exactly estimated. Our enjoyment of the subtle relations of linear magnitude which enter into the beauty of a refined face shows how delicate this quantitative appreciation really is.

It is to be observed further that this fine sense of proportion among the various parts of a visible form includes a recognition more or less distinct of an equality between relations of magnitude. And it is this fact which brings the sense of proportion under the head of a feeling for similarity and equality. This is plain enough in the case of all imitative forms. The recognition of a face by means of a miniature portrait is really an example of a very fine perception of equalities of relation, for it rests on a

distinct appreciation of the relative linear magnitudes and distances of the several features, and on a perception of the identity of these relations with all changes in absolute magnitude.

It is hardly less certain that the sense of proportion in art, when not thus based on a knowledge of the relations of natural objects, really implies a recognition of the identity of quantitative relations. The enjoyment of a due proportion between the diameter and length of a column, or among the numerous details of a Gothic church, appears to involve first of all a recognition of the correspondence of the *perceived* relations with some *conceived* relations, which supply an ideal standard of proportion. This mental standard may repose either on a sense of utility or fitness of parts to a ruling end, on custom, or finally (in the case of the freer forms) on a vague feeling for the relative æsthetic importance of the several features as parts of a pleasing and well balanced whole. In addition to this the sense of proportion in art often rests on a direct comparison of two or more *directly presented* relations of quantity, as, for example, those subsisting between the subdivisions of the several vertical magnitudes in architecture, which are said to illustrate the ratio known as "the golden section".

These three aspects or moments represent the most abstract principles of unity of form. In practice, these principles commonly combine and blend one with another. This may be seen by a reference to what is known as symmetrical arrangement.

A symmetrical division of parts aims at presenting a number of continuous features under certain aspects of contrast and similarity in relation to some central element. Each element of the design is balanced against some other element opposed to it in direction (that is from the centre), but resembling it in respect of magnitude and distance from the centre. It thus supplies a large amount of the element of unity, and is indeed the most regular of all forms.

The most perfectly symmetrical figure is that which is so in respect of each pair of opposite sides or directions, as the rectangle, the polygon with even number of sides, the circle, &c. But such arrangements are apt to be too stiffly regular for art, which, needing abundance of freedom and variety, usually contents itself with symmetry in one direction, namely, bilateral symmetry. Why symmetry in a horizontal direction should please rather than in a vertical or any other direction will be explained further on.

It may still be objected that I am confounding art and science, and giving to unity and regularity an exaggerated æsthetic importance. This objection will, I think, be largely obviated by the observation, which I have hitherto postponed,

that the uniting element is often present in an *ideal* manner only, suggested to the mind rather than directly presented. Thus the continuity of a form has sometimes to be appreciated by help of an ideal completion. A crescent, for example, may please the eye because it is so easily expanded by the imagination into a whole circle. Much more frequently does the central element of a design need to be supplied by the mind of the spectator. The beauty of an undulating or of a spiral curve rests in part on a vague representation of the central axis, about which its seemingly free movements arrange themselves in so simple an order. In many symmetrical arrangements, too, as those of the human figure, the central element to which all relations are more or less consciously referred has to be put into the figure by the mind.

The value of such subjectively restored elements of unity is seen in a striking way in the fact that the feeling for order and unity may be satisfied when there is only an approximation to a regular arrangement. The eye, like the ear, can easily bear departures from rigid regularity, if only it is able in a rough and general way to group the details under relations of equality and symmetry. This it does in those freer forms of sculpture and painting which mark a high development of art. Provided this departure of form does not appear to the eye as an error, as a failure to reach perfect exactness; that is to say, provided it is seen to be intended and is felt to be justified, the fact of approximation yields an appreciable enjoyment. The visual imagination here supplements the visual sense, and sees a rightness where the latter alone would see but error.

It is easy to see, by help of this principle, that all the visual arts seek in some degree to satisfy the eye's feeling for form. In some arts, as painting, the element of form is no doubt a good deal subordinated to the exigencies of imitation, and of a wide picturesque variety of detail. Even in sculpture, perfect regularity of form is in the higher stages of art-development sacrificed in favour of variety of treatment and natural ease. In truth, the progress of art is largely a progress in freedom of treatment, as we may see by comparing the rigid symmetry of Cimabue with the graceful ease of Raphael, or the stiff regularity of early Greek sculpture with the freedom of the later and better work. Yet while the principles of form become less conspicuous, they are not wholly abandoned. A Madonna of Raphael may suggest the pyramidical form which an earlier altar-piece so naïvely forces on our attention. In other words, in the best periods of art, form only disguises itself, becomes more a matter of imaginative reconstruction, and appeals to a finer kind of æsthetic perception. One may add that every now and again the artist

will distinctly aim at satisfying the eye's feeling for form by what may almost seem a childish device. Even a Turner does not disdain to please the eye by introducing into his pictures accidental repetitions of form in different objects.[1]

All good art thus does homage to the principle of form. One may even go further, and say that the characteristic effect of asymmetry, illustrated in many Japanese designs, is really due to a just feeling for form. Like discords and occasional suspensions of tone-interval and equal time in music, such irregularities owe their piquancy to the very sense of a law that is broken, not violently, but, so to speak, in childish freakishness.

In this brief analysis of the direct factor in pleasing visual form, I have regarded the immediate activity of the eye as something ultimate, only referring now and again to the effects of habit in facilitating certain kinds of motor activity. But modern psychological ideas will enable us to explain to some extent how the eye has come to be so constituted as to take pleasure in the kinds of activity just described. There is no room here for more than a brief elucidation of this aspect of the subject.

The doctrine of evolution leads us to view an organ of perception, together with its customary modes of action, as slowly determined by the action of the environment and the needs of practical life. A part of this operation goes on in the individual life, having as its result the selection of the habitual actions as the most easy and most agreeable. A part requires the life of the race for its carrying out, and has for its product a certain innate structure and disposition. The modes of agreeable visual perception illustrate these processes of adaptation to the conditions of practical life. Thus, as I have already hinted in passing, the eye's preference for the horizontal direction, for symmetrical movements of convergence and so on, may possibly be explained as the result of habits determined by the greater utility of these particular movements. And it is probable, as Wundt suggests, that the innate peculiarities of the eye's mechanism which favour certain kinds of movement, as horizontal, and those from the centre of the field, are themselves the result of long processes of racial adaptation.

What applies to the most natural and agreeable modes of ocular movement, applies also to the more pleasurable modes of the higher intellectual appreciation of form. The very feeling for unity of form in any shape is probably related to those deep wants of our existence which have determined the structure of

[1] Mr. Ruskin brings this effect under his Law of Repetition. He calls attention to two instances of it in the water-colour paintings of Turner exhibited by him in 1878.

our intellectual organ to be what it is. And in the case of the æsthetic value of the several modes of this unity, the action of the environment becomes apparent. Thus, for example, the natural instinct of the cultivated eye to look for a well-marked contour, as well as for a central element of repose, in a design, may be regarded as the result of ingrained habits, determined by the conditions of a distinct visual grasp and recognition of objects in every-day life. So the desire of the eye for proportion seems to be an outgrowth of a habit of attending to relative magnitude, a habit that is clearly connected with the paramount importance of identifying objects at different distances from the eye.[1] And it is possible that the preference for the ratio known as "the golden section" in art, a relation which, according to Zeising, is found exemplified in the various proportions of the human figure, may be due to a habit of making that most impressive and carefully observed form a standard of measurement.

The æsthetic value of symmetry, and more especially bilateral symmetry, illustrates in a striking way this action of the environment and of habit in determining our most pleasurable modes of activity. Mr. Grant Allen has recently remarked on this fact (MIND XV.), but without any special reference to *bilateral* symmetry. Not only do most organic forms present such a bilateral symmetry, but the forms of inanimate nature, as mountain and valley, show this same relation. The very action of the physical forces determining the configuration of the earth's surface, tends to produce a bilaterally symmetrical arrangement, as we may see by the simple experiment of throwing down a heap of pebbles or sand on the ground. Over and above this the ends of support, and the utilities of life in general, serve to give bilateral symmetry a high practical value. Most of the products of the useful arts, from architecture down to the art of constructing common utensils, possess this bilateral symmetry. This prevalence of the relation, in objects of daily perception, would serve to fix a habit of looking for symmetry as the normal form of things. In other words, bilateral symmetry would tend to become, to speak after Kant, a sort of *à priori* form of æsthetic intuition.[1]

But this direct factor is, after all, only one feature of visual form, which, in concrete æsthetic perception, combines with other indirect or associated elements. Over and above the direct

[1] I know a child that, when three years old, at once recognised the faces of several relatives by means of a photograph taken eight years before. The photograph was a *carte de visite* group, in which there were just a dozen full length figures, as well as a good piece of background space. Such a power of appreciating form, shown at so early an age, suggests that there may be an innate disposition to recognise identity by means of equality of relative magnitude.

action of the environment, and of customary experience in producing an instinctive preference of the eye for some kinds of activity, there is an indirect action of experience in attaching to certain elements and arrangements of form an æsthetic value by reason of associated feelings and ideas. This other great factor in visual form has received a fair amount of attention, and it does not call for more than a brief notice here.

ASSOCIATED FACTOR.

So far as forms are strictly non-imitative, and not determined by any needs of fitness to some recognised practical end, the associated factor must reside in certain comparatively abstract qualities. These are in the main resolvable into two classes, those æsthetic aspects which depend on association with touch and movement, and those which involve an idea of human skill.[1]

If tactual and muscular experiences (other than those of the ocular muscles) are organically embodied into our customary visual perceptions, we shall be prepared to find that the pleasurable side of visual form embraces elements drawn from this region. In truth, all the valued features of form may be said to involve such extraneous feelings. The superior importance of the vertical and horizontal directions, the specially restful character of the horizontal, and the aspiring aspect of the vertical, the voluptuous nature of the curve as opposed to the severity of the straight line, point to these deeper and fuller experiences. Even the value of bilateral symmetry for the eye may owe something to that well-marked rhythmic contrast of right and left, which the movements of the tactual organ yield to us. Again, it is easy to see that the various charm of distance, the wooing character of the remote and retiring, and the stimulating aspect of the near and prominent (reflected in a degree in the different effects of convex and concave surface), and the sublime suggestions of great height, all draw their material from experiences of the greater motor organs. So, too, our larger muscular experiences, with their new feeling of resistance and distinct sense of force, furnish elements to our appreciation of fragile grace appearing to ask for support, and of all stability of form. Lastly, the residue of tactile experience (alone or in combination with muscular sense) is traceable

[1] A third class of such general and abstract associations might be constituted by the symbolic aspects or the moral and religious suggestions of form (as that of moral rectitude, infinity, &c.), but these are too vague and uncertain to require notice here.

plainly enough in the charm of smooth and rounded surface, of that characteristic quality of sculpture which Mr. Ruskin has well called its "bossiness".[1]

The second class of æsthetically valuable suggestions in the visual perception of form are those of human skill. Man is a constructive animal, and his habits of construction lead him, as Mr. Grant Allen has observed, in the essay already spoken of, to view all forms in nature, as well as in art, in relation to the degree of skill needed to produce them.[2] Thus a perfectly straight line, even in nature, irresistibly calls up a vague consciousness of artistic finish. The peculiar charm of all smaller and more delicate forms rests in part on this vague feeling of fine workmanship. So, too, all perfect regularity and symmetry satisfies this feeling for perfection of handicraft. And, on the other side, departures from regularity when they suggest the idea of bad workmanship, are, as I have already remarked, distinctly unpleasant.

In addition to these wide-spread abstract associations with form, there are more circumscribed and concrete associations depending on a vague resemblance to some agreeable natural form. Of these associations, the suggestions of human form constitute the most valuable æsthetic element. The supreme interest of the human presence makes us ever ready to see analogies to the human attitude and mode of movement in inanimate nature, and so we fall into the habit of attributing a quasi-human interest to the drooping plant, the stalwart tree rejoicing in its battles with the wind, and the venerable mountain looking down on our lower earth with an expression of Jovian calm. Art, when not distinctly imitative, owes something to these vague suggestions. Thus, we are disposed to transform supporting columns into Caryatides before art itself transforms them for us. Next to the human figure, other of the more beautiful organic forms may furnish such associations to the eye. Thus, the Corinthian capital, and forms frequently found in ornamental design, please the eye in part through a vague feeling of their plant-like character.

The reader may perhaps expect me to assign the relative values to these various factors in agreeable form. But psychology is not yet a quantitative science; and this being so, æsthetics must be content with enumerating the elements, without seeking to measure exactly their relative values. I have insisted on the

[1] Herder calls sculpture the art of touch, in contradistinction to painting the art of sight.

[2] This idea of skill will, in the case of the useful arts, take the form of an intuition of a nice adjustment of means to ends and so become a component element in the sense of fitness.

presence of a direct sensuous element in visual form apart from the pleasures of light and shade. In daily experience we may not be aware of the pleasure which ocular movement in its real or ideal form is fitted to yield, just because our eye usually attends to these movements only as signs of important objective facts. But when this significance is withdrawn, as in a decorative arabesque design, we may easily become aware of the pleasurable character of such movement. And it must be supposed that this element enters as a very appreciable factor into the whole delight which sculpture and architecture afford us. Even though not a considerable pleasure in isolation from other modes of enjoyment, it may contribute a valuable factor to such a compound æsthetic impression.[1]

But though emphasising these elementary motor experiences of the eye as a factor in agreeable form, I would not exaggerate their importance. It must be remembered that the experiences of touch and extra-ocular movement are inseparably embodied with ocular feelings of movement in the eye's perception even of form-elements, and the former are at least equally valuable with the latter. For the rest, I attach much value to the intellectual factor in the appreciation of form; that is, the co-ordination of numbers of these slightly pleasurable elements under agreeable relations of unity and proportion. Taking the factors just named as the *direct* factor, and contrasting them with the less directly associated elements as the *indirect* factor, I should say that the former decidedly outweighs the latter in what we call beauty of form. Every beautiful form will, I think, be found to owe its charm in the main either to the specially pleasurable character of its elements (ocular or tactual), or to the presence of a large number of distinct aspects of variety and unity. The former is the beauty of simple forms, the latter that of intricate forms.

As to the value of the less abstract associations, on which Mr. Gurney has insisted in the article already named, I think that, though real, it is far less in the case of visual forms than of melodic forms.[2] I quite agree with him that the nameless charm of some melodies must be attributed to processes

[1] According to Fechner's principle of æsthetic support (*Vorschule der Æsthetik*, pp. 50, *ff.*).

[2] Not because it is easier to combine elements of form than elements of tone in ways which shall not remind us of real experience: it should be less easy because tones themselves are less imitative than the elements of visual form; but rather because the emotional suggestions are less powerful in the former case than in the latter. In the case of the charm of a concrete form, as that of the human face, I hold with Mr. Gurney that suggestion may be as powerful an influence as it is in melodic form.

of suggestion too subtle for us to retrace. But in the case of visual form, the associated elements appear to me to be in general much more definite and easily recognisable, and though, as I have pointed out, the æsthetic value of free and non-imitative forms may frequently be referred in part to associations with particular objects, such associated elements seem to me never to constitute the main beauty of these forms. Speaking, then, with the hesitation which becomes all utterance on a subject where precise scientific determination has to be replaced by vague individual opinion, I should say that those varieties of art in which visual form counts as the chief end, more particularly uncoloured decorative designing and architecture, contrast with music as well as the distinctly imitative arts in the weakness of their (indirectly) associated factor, as they certainly contrast with music and the arts of colour in the weakness of their direct sensuous element.

JAMES SULLY.

III.—PAIN AND DEATH.

SOME three years since, in my little volume of *Physiological Æsthetics*, I put forth certain views on the nature of pleasure and pain, which then appeared to me a slight advance upon the main theory already elaborated and demonstrated by Professor Bain and Mr. Herbert Spencer. A chapter in that work endeavoured to show that, while pleasure was the subjective concomitant of due activity in any or every organ directly continuous with the cerebral centres, pain was more specially connected with actual destruction or disruption of sentient tissues. These opinions still appear to me to be well-grounded; but certain further modifications have since occurred to my mind as more fully elucidating the true nature and origin of the feeling of pain. I propose in the present paper to discuss somewhat cursorily such additional *aperçus*, and to point out certain apparent corollaries as regards the present function and value of pain in the human economy.

An absolutely perfect animal, adapted in every possible particular to every possible variation in its environment, would have no need whatsoever of pain as a warning against impending dissolution. The external marks of approaching danger would be followed instinctively or automatically by the proper movements for ensuring full self-preservation. Such an ideally perfect self-conserving machine, whether figured as conscious or

unconscious, would always by the laws of its mechanism respond directly to every conceivable combination of circumstances unfavourable to its continued existence as an organised whole, and would respond in such a manner as to prevent its threatened annihilation or disorganisation from being actually effected. To put the case concretely, it would meet the phenomena which herald the approach of famine by storing up provisions in advance; the approach of flood by building an ark of safety; the approach of conflagration by providing fire-proof dwellings and absolutely archetypal water-hose extinguishers. Disease it would not know, for it would never overwork its digestion at one period, to sow the seeds of dyspepsia in another; nor would it expose itself to chills and draughts, to become the future parents of consumption and bronchitis. It would never burn its fingers in a fire, tear its flesh with nails and splinters, or overwork its eyes in poring over microscopical Greek type. Thus it would have no need of the monitor we call pain; and what is more, it could not practically experience it—unless, of course, under conditions quite unlike those of existing animals. For since pain, within the limit of our experience, is the concomitant of actions directly or indirectly tending towards dissolution of the organism, and since by our hypothesis the ideally perfect animal would never expose itself to such actions, whether coming from within or from without—it must follow that it could never feel pain under the only conditions in which we know it to occur. If the ideal animal, thus conceived, be envisaged as a separate creation, we should expect that it would be created painless; or if it be envisaged as the result of evolution from existing types, then we should expect that the faculty of feeling pain, which it potentially derived from its ancestors, would be practically never evoked for want of the proper exciting circumstances. Pain would not then be in the position of a feeling which had survived its function: it would be simply a feeling which had ceased to exist for want of exciting cause, just as vision has ceased to exist in some of the not yet quite blind fishes and reptiles of the Carinthian caves.

It may be objected that such a fanciful picture as this can be of little use in practical psychology, just as the fanciful pictures of political economy are said to have caused much fallacious reasoning in that department of thought. But in reality these imaginary diagrammatic cases are never dangerous, if only they are accepted in their true light as isolated aspects of the concrete phenomena under investigation. I hope the reader will recognise in the sequel that this simplified ideal form is of real use in enabling us to grasp the bearings of our problem.

Our perfect animal, then, may be conceived of either as en-

dowed with "perpetual motion," in which case, of course, it would never die at all; or, in stricter accordance with the theory of dissipation of energy, it may be conceived as having a natural termination to its organised existence, in which case its life would be an *equilibrium mobile*, as Mr. Herbert Spencer puts it, ending in the "final equilibration" of death.

Now, stopping short of such an absolute ideal as that rudely sketched out above, let us consider from this point of view the realised ideal of the animal world in its highest existing outcome —a prudent, moral, healthy, civilised man. Such a man possesses an intellectual recognition of the fact of death: he knows that, sooner or later, his existence as an organised being will come to an end. He knows also several of the modes in which this destruction of his concrete identity may take place—as by disease, starvation, drowning, fire, violence, or accident. And in so far as he is prudent and normally healthy, his main personal object in life (taking into consideration his isolated individuality alone) will be to avoid all such premature forms of death, and to continue his own full organic activity in every particular up to the time of his final and inevitable dissolution. In so far as he is healthily moral, again, his main object in his relation to other individuals will be to prevent for his friends and dependants, and so far as in him lies for all others, the same premature forms of death, and to ensure for them the same full organic activity up to the time of their necessary end. For this object he will, at the very least, abstain from such actions as will interfere with their organic activity, such as killing, beating, stealing from, or traducing them. But with these latter moral considerations we have nothing to do here, and I merely notice them to tone down the apparent (but only apparent) harshness of the previous statement that the main personal business of a prudent and moral man is the avoidance of his own premature extinction, and the maintenance of his own full organic activity up to the latest possible point.

Apart from all considerations of pleasure or pain, the principles here noted are clearly implied in the very nature of organic life. If an intelligent being, propagating its like by heredity, were to be conscious that a certain line of conduct ended in premature extinction, and were yet to follow it by preference to another line ending in full organic activity for self and offspring, such a being must inevitably tend to extinction, both individually and generically (or rather genetically). This we actually see in the case of suicides, habitual drunkards, and opium eaters. On the other hand, all those amongst its contemporaries—its competitors in the struggle for life—who refrained from such self-destructive lines of conduct, and pursued more or less completely the oppo-

site line which tends toward the fullest preservation of self and offspring, would thereby themselves continue to exist, and would become the parents of the most numerous, the most healthy, and the most successful descendants. This we actually see, on an average, amongst all the prosperous and vigorous families in the world around us.

Thus it follows that we might conceive of intelligent creatures to whom the preservation of their own lives and that of their fellows had become, by hereditary transmission, an *organic* end in itself, a something aimed at as it were by instinct, apart from any feeling of pleasure and pain. There can be little doubt that this is to some slight extent the case even in our own species. We shrink organically from any immense impending danger: we run, without thinking why, from a levelled gun, a falling rock, a springing wild beast: we snatch a child instinctively from the wheels of a carriage or a railway train. Setting aside the superstitious fears with which death has been long surrounded, and the natural reluctance to grieve friends and dependants by total removal from their sphere, every-day language and experience seem to imply that most healthy persons, even amongst the emancipated class, have a strong and deep-seated personal repugnance to the idea of death for themselves. But this feeling has probably or all but certainly arisen since the notion of death as a possibility for oneself has been formed within the human consciousness. There is no reason to suppose that animals ever figure to themselves their own future extinction, and even the human mind seems to have reached the conception by very slow degrees. Our whole experience being that of a world in which our own consciousness forms the constant central factor, it is only by a violent exercise of imagination and analogy that we are enabled to conceive the existence of a world in which other consciousnesses alone remain. Even the final dissolution of his own organic body must have been to the primæval savage a late and slowly-acquired idea. At some time or other a developing anthropoid, seeing the anthropoids about him fall one by one in battle or by old age and decay into the dust, must have said for the first time to himself or to his neighbour, "We too must die." And now, by long repetition, that familiar phrase, "All men are mortal," has become an integral part of our whole reasoning life. Yet even to this day it is doubtful, as anthropologists tell us, whether the lowest savages have fully grasped the notion of death as an inevitable certainty for themselves and their friends. They regard it rather as a special and exceptional accident.

Here, then, we get a certain amount of light shed upon the nature of pleasure and pain. If all animals were and had always been highly intelligent, if they all had clearly before their eyes

the conception of death as a possible occurrence to themselves, if they definitely set its avoidance before them as the main object of their lives, and if they were rationally able to interpret all the threatenings of danger afforded them by external phenomena, there would never have been any necessity for the existence of such feelings as pleasure and pain. But inasmuch as all animals were originally unintelligent, as they had of course no conception of death, and as they were therefore incapable of rationally interpreting the menaces of surrounding nature, it became necessary that they should possess a quasi-automatic mechanism for the avoidance of what was hurtful and the pursuit of what was salutary. Such a mechanism is afforded by the feelings of pleasure and pain.

How those feelings originated we can no more say than we can say with any other part of consciousness. No sleight of mouth can bridge over for our present intelligence the unfathomable gulf between the insentient and the sentient. That consciousness should evolve out of the unconscious is perhaps inconceivable: that it should evolve out of some primordial mind-stuff, as Professor Clifford supposed, out of some subjective germ, some embryo spiritualistic side in the primitive atom, as I understand Mr. Herbert Spencer to suggest, is conceivable indeed, but scarcely picturable to our minds. Consciousness seems, in fact, incapable of grasping its own ultimate analytic unit, save in some very symbolical and indefinite sense. But that there was once a real objective world, in which consciousness existed only in this nebulous form, I for one must continue to believe, in spite of the arguments of idealists to the contrary. I cannot picture to myself a world without perception, a universe with no phenomena, but I am compelled to believe in it. And when this relatively unconscious world, this mass of unpicturable matter in which mind only potentially existed as unorganised mind-stuff, or as consciousness-nebula, first developed something like that orderly arrangement of mind-units which we call feeling, it seems to me fairly certain that the earliest of such feelings must have been pleasures and pains. In other words, I think that pleasure and pain must have been (relatively speaking) the primordial form of consciousness. I say relatively speaking, because I do not mean that they are primordial in the sense that the supposed ultimate mind-unit is primordial, but merely that they were apparently the first feelings recognisable as such, the earliest element of mind to be developed into a form now within the reach of our analysis.

How it could have been otherwise is difficult to see. For all perception and all intelligence have only a meaning so far as they relate to possible pleasures and possible pains. The animal

sees its food that it may eat it; sees its enemy that it may avoid his tearing fangs. Every fresh sense becomes a guide to further pleasures, a warning against further pains. Every increment in intelligence is merely an increase in the number of combinations by which the organism anticipates the one positively and the other negatively, through an ever widening distance in space and time.[1] In fact, pleasures and pains are the real central substance of our whole lives, all other portions of consciousness being merely subsidiary to these fundamental and all-important primary feelings.

But though it is difficult to say how such feelings could ever have originated in a relatively insentient world, and though we can only symbolically represent to ourselves the mode of their origination by a clumsy materialistic picture of mind-units set side by side in a definite order, just as the atoms which form their objective counterparts are definitely arranged to make up a polyp or a man,—it is nevertheless easy to see why such feelings, once started, should go on to increase in definiteness and in strength. For since a pain, which is objectively known as the correlative of disruption or destruction, is subjectively known as "a feeling which we seek to get out of consciousness and to keep out"; and since a pleasure, which is objectively known as the correlative of due function, is subjectively known as "a feeling which we seek to bring into consciousness and to retain there," it would necessarily follow that all those individual organisms which possessed these feelings in the highest degree would most uniformly avoid self-destructive actions and pursue self-conservative actions. If we suppose that any animal were actually to delight in self-destructive actions and avoid self-conservative actions, we can see at once that it and its kind must necessarily tend to become obsolete. And this is not a mere hypothetical case, for many animals do actually, under certain circumstances, contract self-destructive or race-destructive tastes, and do accordingly in so much tend to die out. But none the less it is inconceivable that such a combination as that between ultimately destructive activities and the subjective sense of pleasure should ever become permanent and habitual: and even the apparent temporary combination resolves itself on ultimate analysis into a mixture of immediately pleasurable feelings with ulterior life-destroying effects.

Again, there is, it has always seemed to me, a certain curious correspondence between the subjective feeling of pain and the notion of bodily destruction, as between the subjective feeling of

[1] I need hardly mark here my obligations to Mr. Herbert Spencer's *Principles of Psychology*, which are sufficiently obvious throughout.

pleasure and the notion of due bodily function. In what the sense of fitness consists it would be hard to say, and many people will think it fanciful; yet it has long appeared to me an important point in the question of the connexion between object and subject.

Mr. W. James has observed on this point (MIND XIII., p. 18) that "the only very considerable attempt to explain the *distribution* of our feelings" is the one given in my *Physiological Æsthetics*, and, he says, its "reasoning is based exclusively on that causal efficacity of pleasures and pains which the 'double-aspect' partisans so strenuously deny". But it does not seem to me that this implication is really contained in the view here expressed. For the fact is that the very separateness and non-interference of the subjective series and the objective series makes it impossible to treat pleasures and pains save under both aspects. No doubt, if we could trace the whole series of physical actions which take place in our nervous system when the sight of a pleasant or painful object sets up a certain set of movements in our bodies, we should see that the objective series on its side was perfectly explicable upon merely mechanical grounds—that energy was liberated in certain ganglia by the incident light-rays, and that this energy, undergoing certain definite recombinations in other ganglia, finally produced, on purely physical principles, the appropriate movements. We should find, I believe, that the whole set of movements could be mentally pictured as similarly occurring in a perfectly insentient automaton. But then, on the other hand, we know that the subjective series, on its side, gives us a completely parallel set of facts, which can only be expressed in subjective terms. We say truly that we saw the fruit, that we liked it, that we willed to eat it, and that the act of willing resulted in the eating. And after all, the subjective facts are the real and certain ones, while the objective facts are only hypothetical pictures of the subjective experiences which might be realised by an imaginary spectator if he could see inside our brains. Accordingly, it is quite open to us to treat the subject from either point of view, without at all deciding the question as to their mutual relations. I am so thorough-going a "double-aspect partisan," that I refuse entirely to dissociate the two aspects, or to assert that there is any such "causal efficacity" whereby the mental side interferes with the strictly physical current of the bodily side. I know the two sets of phenomena only in their union, and I cannot say what the mental side might or might not do in isolation. They seem to me not two things, but two ways of looking at one and the same thing.

To resume our main thread of exposition. The feelings of pleasure and pain thus originated, though on the whole good

rough guides for action, are far from being perfect guides. On the contrary, they are only approximately accurate, like most of the other adaptations of organisms to their environment. Their original form of correspondence is apparently very simple. Not *every* kind of hurtful action is painful, but only one most common kind. So, not *every* kind of desirable action is pleasurable, but only a few most desirable kinds, at least to any noteworthy degree. As soon as feeling exists at all, it seems probable that that feeling is aroused in the painful mode by any attempt to dismember or destroy the organism. To the last, this remains the chief form of physical pain. To cut, tear, or pull off a limb or tissue, to burn or otherwise chemically disintegrate any part of the body, is the commonest species of pain. Other special species, such as to din the ears, dazzle the eyes, burn the tongue with pungent substances, or fatigue the limbs with over-exertion, all agree at bottom, as I have endeavoured to show elsewhere,[1] in this fundamental point, that they imply destruction or excessive waste of tissue. On the other hand, the two main functions of animal life, feeding—which is necessary for the continuance of the individual—and procreation—which is necessary for the continuance of the race—are apparently accompanied by pleasurable feeling in the very lowest animals which show any trace of feeling in any shape, while most other organic functions are comparatively neutral. A special reason for these restrictions will be treated of hereafter.

Intelligence is solely useful to the animal inasmuch as it enables it to compass more pleasures and avoid more pains or, in other words (putting it objectively), to perform a greater number of life-serving actions and to avoid a greater number of destructive agencies. But inasmuch as pleasure and pain will be of comparatively little use without so much memory as will suffice for the formation of an *experience*—for a single pleasure or pain once felt and then forgotten would not act as a guide in future cases—it would naturally follow that the increase of intelligence would be accompanied *pari passu* with an increased sensitiveness to pleasures and pains. This *a priori* inference seems likewise (so far as our blind guesses allow us to conjecture) to be borne out by facts: for the higher and more intelligent animals all exhibit the supposed phenomenal signs of pleasure and pain far more distinctly than the lower and less intelligent. The memory of a past pain becomes with them a deterrent from the line of conduct which would end in pain; and the memory of a past pleasure becomes the inducement to a line of conduct which actually ends in similar pleasure. And at the same time

[1] See *Physiological Æsthetics, passim.*

the pleasures and pains themselves become, apparently, more vivid and more definite.

So far, we have only spoken of physical pains. But with increasing development there comes a point at which a second class of pains is introduced, which are commonly called mental. Of course, however, all kinds of pain are, strictly speaking, mental, while on the other hand they all possess a bodily counterpart. It would, therefore, be more correct, perhaps, to speak of the first class as nervous and the second as cerebral or central, though even this distinction is by no means free from ambiguity. To treat of these pains at full length would be beside the present purpose. It must suffice to say that they are of several kinds—some personal, as the feeling of worry, bother, difficulty; others altruistic, as sorrow for loss of friends, sympathy, and so forth. But they apparently agree more or less with physical pain, in the fact that they are concomitants of a waste of tissue, an excessive expenditure of energy. On the subjective side, however, they differ in being rather *distresses* than *pains proper*. The true painful element, which we see exemplified in pulling a tooth or cutting off a limb, is wanting: the feeling of distress sometimes approximates a little more to that of bodily weariness from over-exertion. In fact, the pain of mental grief has probably for its physical counterpart an excessive waste of brain-tissue, just as weariness has for its physical counterpart an excessive waste of muscle and nerve-tissue.

Now, amongst the lower animals, the immediate pains of bodily disruption, as exemplified in scratches, bites, blows, kicks, and the like, are the most powerful and important. But with man, and especially with civilised man, the representative pains of the cerebral class are the most important. Moreover, as bodily pain is merely connected with actual disruption of tissue, which is after all only a rough gauge of desirability, it often happens that man must bear one bodily pain to avoid a greater or a mental pain. Hence it turns out that for man, to a considerable extent, bodily pain is a feeling which has outlived its function. When we are infants, it is true, pain is to a great extent a useful monitor; but in after-life it often happens that it is really a useless encumbrance. We see this in the demand for anæsthetics. The pain of drawing a tooth, of amputating a diseased limb, of undergoing a surgical operation, is of no use whatsoever to us. Even pricks, scratches, burns, and internal pains are for the most part of little good to us. Our tissues have inherited from their ancestors a sensibility which is comparatively seldom of any practical value, and which under certain circumstances becomes a positive disadvantage. Intelli-

gence now largely supplies the place which pain once supplied. No sensible man—nay, no fool even—would ever cut off his hand, even if the operation were painless, because he knows he will want his hand in future: just as no man throws away a valuable implement. So the pain which he must undergo if he is obliged to have his hand amputated is so much dead loss to him. In the end of life, especially, pain obviously is of no further use to the organism, and a simple means of alleviating or removing it during the last moments becomes a clear desideratum of humanity.

On the other hand, we must not forget that pains whose function is apparently obsolete may yet have some unsuspected use in our economy even at the present day. Thus, Mr. Sully, commenting upon this very theory of pain, asked in MIND VII., p. 389, of what use were "the torments attending an injury to the dental nerve". In the next number of MIND I endeavoured to answer his question by pointing out the immense importance of teeth to our anthropoid ancestors, who used them not only for mastication, but also in the place of numerous human implements; yet I allowed that in man the large dental nerves might be regarded as somewhat unnecessary survivals, since man does not often run much risk of breaking his teeth. Some time afterwards, however, I happened to mention the subject in conversation with a medical friend, and he at once objected to such a conclusion, on the ground that the dental nerves still fulfilled a most important function in the human body. For our teeth, as he rightly pointed out, are extremely liable to decay early, from the artificial nature of our food; and this decay and consequent loss prevents us from masticating properly, and so gives rise to dyspepsia, with a whole train of subsequent diseases. Thus, a twinge of toothache, by inducing us to go to a dentist and have the decay arrested, helps to preserve our digestion and ultimately our lives. From this point of view, we can hardly consider the dental nerves as excessively large, considering the immense importance of proper mastication and digestion to health and longevity.

Again, though bodily pain (in spite of such exceptions) is thus often quite useless, we must remember that the mental pains are in great part made up of representations of bodily pains. And as the latter are undoubtedly important for our guidance and preservation, we must allow that bodily pain as a whole still indirectly subserves an important function even in human life.

Pleasure, on the other hand, of course even now keeps its function as fully as ever, for all our activities are and can be guided by pleasure alone in some form or other.

In the imaginary sketch given above of a prudent man, I have

supposed him to be governed ultimately by an abstract desire to keep up the cycle of his own organic activities to the very latest possible period. But in concrete life this is not the form which his desires actually take. No animal really wishes that its own functions, as such, should continue indefinitely in a certain manner. Amongst the lowest animals the immediate monitors of present pleasure and pain are alone regarded, and they are regarded without any conception of their ultimate implications. With intelligent animals, the whole possible body of pleasures and pains is taken into consideration, but still for its own sake only. With man, the conception of life as an end apart from special pleasures or pains arises, but even with man life is prized for the sake of the sum total of its pleasures, and not for the most part as an abstract end-in-itself. Thus, while in the scheme of nature (to use a transparent metaphor) life is the end, and pleasure and pain the means for its preservation, to the individual animal or the individual man pleasure and pain are the real motives, and life is either not regarded at all in itself, or regarded according to the proportion of its pleasures and pains. We say to ourselves, "Such and such a course will bring wealth, honour, prosperity," not "It will lengthen and preserve life"; or "Such a course will bring poverty, misery, distress," not "It will entail death". Hence, it happens that we sometimes pursue pleasures at the ultimate expense of life, or are induced by pains actually to court death, as is the case with suicides. Here pleasures and pains entirely miss their true function, and become subservient to self-destruction, instead of to self-preservation.

All this, however, inevitably follows from the mode in which feeling was originally developed. As the animal has no conception of death, it can have no conception of the preservation of life as an end-in-itself. Hence it must necessarily be guided by an immediate monitor, such as pleasure and pain. These feelings must then become deeply ingrained in the nervous system, and transmitted by heredity to all descendants. The impulse to obey the monitors in question must be practically irresistible, and when intelligence rises to the level where the conception of death is possible, it must still happen that the avoidance of pains and the pursuit of pleasures must be the main consideration, while the avoidance of death and the prolongation of life is only vaguely and occasionally present to the mind. And since the two aims are on the whole practically identical, the one serves very nearly as well as the other. It is only when (as with the drunkard or the suicide) the two diverge that the guidance of pleasure and pain becomes opposed to self-preservation. In such cases (to employ the same metaphor once more) we may say that nature has planned clumsily, and has therefore missed

her main object. The means which she adopted for ensuring self-preservation have, through their too great generality, finally led to self-destruction.

It may be worth while to add that in all pleasures and all pains what is absolutely the means to an ulterior end is relatively an end-in-itself to the particular animal. Thus, in taking food, the gratification derived is the end so far as the individual is concerned; but self-preservation is the object of nature. So in procreation, the gratification is the end to the individual; but race-preservation is the object of nature. Once more, the pain of the burnt finger is a negative end to the child, a thing to be avoided for its own sake; but nature avoids it for the sake of preserving the child's hand intact. And lest anyone should imagine that I am here unduly anthropomorphising nature, I shall add that the expression is a loose but convenient representation of the fact that the feeling exists through natural selection because it favours the preservation of the individual and of the species.

And now let us turn briefly to another question—the question of the special limitations of pleasures and pains. Mr. Sully, in the critique quoted above, objects that the painlessness of certain internal diseases, in which, nevertheless, disruption of tissue obviously occurs, is a weighty argument against the view here put forward. At first sight this appears a serious difficulty, but I believe it is only an apparent one. Let us see the reason why.

A pleasure or a pain can only be of use through the impulse which it gives to voluntary muscles. Conversely, a voluntary muscle is only of use to obey the impulses of pleasures or pains. To a wholly automatic animal, whose whole life consisted, let us say, of regular rhythmical contractions and expansions, the feelings of pleasure and pain would be useless—that is to say, they would not aid it in keeping up its individual and generic life. In exactly the same way, to any part of an animal (such as the vertebrate heart) whose whole functions consist of such rhythmical movements, the feelings of pleasure and pain are useless. The heart's business is simply to beat, and it is encased within the body out of harm's way. So long as it beats, it does its work well; but when it begins to get disintegrated or diseased, an animal cannot possibly by any voluntary movement do anything to repair it. On the other hand, the muscles and the sense-organs are all intimately connected with the environment. They are capable of receiving very various impulses from the environment, and of reacting accordingly. They may be scratched, torn, or otherwise hurt: they may encounter food, drink, mates, or other desirable objects. Hence it becomes useful to have a very different form of nervous system for these

two sets of organs. The heart and the like automatical portions of the body require on the whole a motor system only: the muscles and sense-organs require in addition a system sensitive to pleasure and pain. In short, feeling is intimately associated with the voluntary or so-called animal side of our organisation, as opposed to the automatic or so-called vegetative side.

If we begin to lacerate or burn a muscle, we can withdraw it from the injurious action, and so prevent further injury. But if we begin to have a lesion in the heart or lungs, we can do nothing (save by round-about medical or hygienic methods of late human origin) to stop the mischief. Answering to these two sets of organs we have two main nervous systems, the cerebro-spinal or voluntary, and the sympathetic or automatic. The first is on the whole a sentient, and the second an insentient system.

Nor is this all. I believe that cerebro-spinal nerves, involved in feeling pleasure and pain, are, roughly speaking, distributed to the principal bodily organs exactly in proportion to the value of such warnings in each case. For example, the organs of reproduction and the tongue are seats of strong pleasures, which are highly useful for race-preservation and self-preservation. The tongue is, furthermore. a seat of specialised pains connected with destructive or disadvantageous foods, and known as bitter, acrid, or pungent tastes, besides possessing the common painful sensibility to laceration or burning. But inasmuch as, when food has once been swallowed, all voluntary power over it is lost, the stomach and intestines are relatively insentient. So the eyes, which are delicate and exposed organs, are supplied with protective nerves, whose painful stimulation acts as a warning against danger; while they are comparatively little endowed with (immediate) pleasurable feelings. The ears, far less exposed, and incapable of voluntary motions, only feel pain in case of disease. In the muscles, pleasure is comparatively little felt in ordinary exercise, because such exercise is neither specially necessary, nor always useful, nor does it stand in need of a strong stimulant; but they are well supplied with nerves capable of feeling pain, because they are very liable to lacerations or other disintegrating actions. And those tegumentary modifications, such as teeth or nails, which are at once particularly useful and particularly liable to injury, are very richly supplied with pain-sentient nerves. On the other hand, most purely internal organs, which can seldom suffer from outer violence, and over which the will has no power, are mainly innervated from the sympathetic.

Perhaps, however, the most conclusive instance is that of the mammalian testes, which. though they are secreting glands ana-

logous to others in the interior of the body (which have no cerebro-spinal nerves), are yet, on account of their exposed situation and great importance, copiously supplied with cerebro-spinal fibres, and are acutely sensitive to a blow. On the other hand, the homologous female organs, the ovaries, being fully protected within the body, have none but sympathetic nerves; while the female mammary glands, which are exposed, have numerous cerebro-spinal fibres, and are as acutely sensitive as the testes: whereas, on the contrary, the functionless male mammæ are as comparatively insensitive as the rest of the chest. In these two pairs of crucial instances we have the antithesis presented in its fullest form.

Until very lately, I was inclined to suppose that *only* the cerebro-spinal system had anything to do with our pleasures and pains, and that the so-called sympathetic was a mere insentient mechanism for the regulation of secreting glands and other automatic organs. But a short time since a book under the title of *Man's Moral Nature*, by Dr. R. M. Bucke, medical superintendent of a lunatic asylum at London, Canada, happened to fall into my hands.[1] This work is one of those essays whose vague generalities inspire the reader with caution and suspicion, at the same time that they are rich in suggestive ideas. With Dr. Bucke's main proposition—that our "moral nature" (whatever that may mean) is connected with the sympathetic system—I cannot at all agree; nor do I think that he has himself formed a very clear conception of what the phrase "moral nature" denotes in his mouth. But his book, which is well worth reading for its curious side-hints, certainly leads a critical reader to doubt whether the sympathetic system may not have much to do with our emotional pleasures and pains, and with that vague, half-unconscious background of feeling which has often quite as great an influence on our general happiness or misery as any definite bodily enjoyments or discomforts. Without appropriating all Dr. Bucke's ideas, I may just note, after him, that women are more emotional than men, and that this vague background seems to have much greater importance as an element of consciousness in their sex than in ours, especially in certain phases of their life; while it is clear that the main difference between the two nervous systems consists in the fact that their cerebral system is relatively poorer and their sympathetic system relatively richer than ours, since the great organs in which they differ from us are mainly supplied with sympathetic fibres. Again, such emotional states are strongest with them just at the period of full functional activity in these organs. So, too, in

[1] For a short notice of this book, see MIND XVII., p. 151.

children emotion is more pronounced than in adults, and here in like manner the sympathetic is relatively richer than the cerebro-spinal system. From these and various other considerations (for which I must refer the reader to Dr. Bucke), it may, perhaps, be inferred, not quite illegitimately, that the sympathetic system has a considerable unspecialised implication with our total emotional condition. If so, it might, by the general sense of restlessness or content which it induced, react upon the voluntary muscular system, and it might also have a large share in producing those actions whereby conjugal or parental affection is utilised for the continuance of the various species.

Be this as it may, it will now be clear, I think, why Mr. Sully's objection respecting the painlessness of many internal diseases has little real weight; for such diseases are really those of glands supplied with few but sympathetic fibres.[1] Yet the distribution of the two classes of nerves is so intricate, and the enveloping coats of most insentient organs are themselves so fully innervated with sentient fibres, that internal diseases present the greatest apparent capriciousness as regards their painful or painless character. We should always remember, however, that no animal but man could derive any possible advantage from feeling an internal pain, as it could not intelligently apply a fitting remedy; and even with man it may be doubted whether medical science has ever done much real good until the last few hundred years. Hence, the true difficulty is to account for the occasional *painfulness* of internal diseases, not for their frequent painlessness. Why should internal muscles or membranes *ever* be supplied with pain-yielding fibres? To this question I believe we can only answer that the cerebro-spinal system is, as it were, constructed on the same plan throughout. A certain number of fibres are distributed pretty generally through all the tissues which it innervates; and though in some highly vulnerable places special collections of pleasure-and-pain-yielding fibres are specially grouped together for a special purpose, as in the tongue, the teeth, and the dermis, yet in all other places a fair number of such fibres are pretty equally distributed, so long as there is no absolute reason to the contrary. Nerves of sentience in the hair or epidermis would be a positive nuisance to man or beast, and therefore they do not occur—for it is desirable that locomotive animals should be externally coated with a protective insentient envelope having no function save that of protection; but in the peritoneum sentient nerves are as a rule neither use-

[1] It may be worth while to remark, in connexion with the views suggested by Dr. Bucke, that though lesions of these organs are often painless, so far as acute or definite pain is concerned, they are very generally accompanied by fretfulness or other vague emotional disturbances.

ful nor hurtful, and therefore the organism does not, so to speak, take any special trouble to dispense with them. In short, pains in internal organs are due, not to a special provision of nerves for the purpose, but to the general sensibility of all afferent cerebro-spinal fibres to disintegrative action.

These stray notes, being really a bundle of after-thoughts, are necessarily somewhat discursive and lacking in form; but I trust the reader will forgive that defect, if they contain anything that is new or suggestive in matter.

GRANT ALLEN.

IV.—MR. SPENCER'S ETHICAL SYSTEM.

THE aim of Mr. Herbert Spencer's recently published book on the *Data of Ethics* is, as the author tells us in his preface, "the establishment of rules of right conduct on a scientific basis". And though the volume itself is not a complete treatise on the subject to which it relates—being, in fact, only the first division of such a treatise—it claims to imply the specific conclusions to be set forth in the entire work "in such wise that definitely to formulate them requires nothing beyond logical deduction". We may take it therefore as containing in outline Mr. Spencer's ethical system; and it has all the more interest, as the exposition of this system is regarded by the author as the culmination of his Synthetic Philosophy, the "part of his task to which all preceding parts are subsidiary". The influence of a book, so prefaced, on the numerous disciples of this Synthetic Philosophy will undoubtedly be great; and as it is to be hoped that Mr. Spencer will find time to complete the work of which this is an instalment, it seems opportune to examine one or two fundamental points in his system, on which, as it appears to me, some further explanation or justification is required. In performing this examination, I shall find it most convenient not to follow closely the order of Mr. Spencer's exposition; but rather to ask, in what seems to me their natural sequence, the chief questions to which every ethical system has to supply an answer, and then to ascertain—by a comparison, if necessary, of different chapters—how these questions are answered by Mr. Spencer.

In the first place, we have to notice a certain ambiguity in the general notion of "establishing rules of conduct on a scientific basis"? Writers who discuss moral rules either from what Mr. Spencer calls "the evolution point of view," or in the earlier manner of the Associationist school, frequently mean by a "scientific" treatment of morality merely an investigation of

the laws according to which the ethical beliefs and sentiments of our own or any other society have come into existence. Such an investigation is obviously a legitimate branch of Sociology or Psychology; and those chapters (cc. vii. and viii.) of Mr. Spencer's book which treat of the "Psychological View" and the "Sociological View" seem to be largely concerned with speculations of this kind. So far as this is the case, I do not propose to criticise either the method or the conclusions of these chapters; what I wish to point out is that this species of inquiry, however successfully conducted, has not necessarily any tendency to "establish" the *authority* of the morality of which it explains the existence. More often, I think, it has an effect of the opposite kind; the "law so analysed," as Bishop Blongram says, is felt after the analysis not to "coerce us much". A scientific explanation of current morality which shall also be an "establishment" of it, must do more than exhibit the causes of existing ethical beliefs; it must show that these causes have operated in such a way as to make these beliefs true. Now this Mr. Spencer certainly does not attempt; for the sufficient reason that he does not admit the final authority of existing ethical beliefs. In the chapters which contain (*inter alia*) his account of the origin of current moral conceptions he is continually criticising them as "defective," "one-sided," "vitiated," destined to give way to a "truer ethics". In short it is this "truer ethics"—Mr. Spencer's morality, not the current morality —which it is his ultimate aim to "establish".

In what way then does Science—that is, Biology, Psychology, and Sociology—provide a basis for this "truer ethics". Mr. Spencer's answer seems to be that these sciences show us, in the first place, a supreme or ultimate end, to the realisation of which human actions are universally or normally directed; and that they enable us, in the second place, to determine the kind of conduct by which this end may be attained in the highest possible degree. Let us begin with the establishment of the end. Mr. Spencer seems to be leading us to this in his two first chapters; in which he considers the conduct to which ethics relates, that is, the voluntary actions of human beings, commonly judged to be right and wrong, as a portion of "universal conduct—conduct as exhibited by all living creatures". He defines conduct, in this wider sense, as the "adjustment of acts to ends"; acts being more precisely defined as external motions of animate beings. He points out how the conduct of the lower animals as compared with the higher, in a scale ascending up to civilised man, "mainly differs in this, that the adjustment of acts to ends are relatively simple and relatively incomplete". What, then, in the case of these lower forms of life, are we to

regard as the ultimate end, to which the special ends of catching food, avoiding foes, &c., are subordinate? Mr. Spencer unhesitatingly says that the "general" or "supreme" end of the adjustments which constitute life is the continuance and further development of these adjustments themselves. Life, in short, is for life's sake; only we are instructed not to measure life merely by its length, but by what is called its "breadth" also; that is, we must take into account the different "quantities of change" that different living beings pass through in the same period of time. We have also, of course, to bear in mind that the actions of any individual may be partly adjusted to the initiation, prolongation and enlargement of other lives besides its own; and we observe that this is to a continually greater extent the case, as we ascend in the scale of living beings. Still, notwithstanding this doubleness of measurement and this complexity of adjustment, "quantity of life" none the less remains the ultimate end of "universal conduct"; and we naturally expect that, when we pass to consider the particular part of this conduct to which ethics relates, this same end will be taken as the final standard for judging actions as right and wrong: especially since, even in speaking of the lower animals, Mr. Spencer does not hesitate to describe actions that fail to sustain life as "conduct falling short of its ideal".[1] And in fact, when he comes to treat of human actions, Mr. Spencer does argue that we commonly regard conduct as good in proportion as it conduces to "the greatest totality of life in self, in offspring, and in fellow-men". But he does not accept this view as final; on the contrary, he is concerned to point out that it involves "an assumption of extreme significance". It is assumed that life "brings a surplus of agreeable feeling"; and this he emphatically declares to be the only possible justification for maintaining it, or for judging conduct to be good that conduces to its preservation. The Ethical End, therefore, in relation to which moral rules are to be established, turns out to be not merely quantity of life, "estimated by multiplying its length into its breadth," but quantity of agreeable feeling, pleasure or happiness.[2]

Now, after all that has been said of the importance of considering human conduct in connexion with the "universal

[1] The frankly teleological point of view from which, in this book, Mr. Spencer contemplates the phenomena of Life generally, seems worthy of notice; since in his *Principles of Biology* he seems to have taken some pains to avoid "teleological implications". *Cf. Pr. of Bi.* c. v. p. 27.

[2] Mr. Spencer seems to use "pleasure" and "happiness"—or at least "quantity of pleasure" and "quantity of happiness"—as convertible terms. I should concur in this: but I think he is rather hasty in condemning Aristotle—who could not foresee how he would be translated into English—for not taking a precisely similar view of the relation of *εὐδαιμονία* to *ἡδονή*.

conduct" of which it is a part, I think that this transition from "quantity of life" which was stated to be the end of the latter to "quantity of pleasure" is too rapidly and lightly made. Pessimism, as Mr. Spencer himself says, stands in the way, declaring that life does not bring with it a surplus of agreeable feeling. We expect therefore a scientific confutation of Pessimism; and I am unable to perceive that this expectation is ever adequately realised. Indeed I am unable to find any passage in which Mr. Spencer expressly undertakes such a confutation. And yet he can hardly think that pessimism is sufficiently confuted by demonstrating that the common moral judgments of mankind imply the assumption that life, on the average, yields a surplus of pleasure over pain. This is not establishing morality on a scientific basis; such an appeal to common sense merely indicates the *pis aller*, the provisional support, with which moralists have to content themselves when they cannot provide a scientific basis for their doctrines.

From a comparison of different passages[1] I am inclined to think that, in Mr. Spencer's view, pessimism is indirectly confuted by the argument—given as an "inevitable deduction from the hypothesis of evolution"—which shows that "necessarily throughout the animate world at large, pains are the correlatives of actions injurious to the organism, while pleasures are the correlatives of actions conducive to its welfare". But, granting this connexion to be established, I do not see how we can strictly infer from it that life on the whole is pleasurable rather than painful. It seems to me that we can only infer that actions preservative of the individual or the race will be generally speaking less painful than those which have an opposite tendency; and that the pains normally endured will not be sufficiently intense to destroy life. The connexion, in fact, leaves nature a choice of alternative methods in her business of adjusting the actions of living beings to the preservation and continuance of life; she may either attract them in the required direction by pleasure, or deter them from divergent courses by pain: it is undeniable that, hitherto at least, her plan of management has combined the two modes of guidance, and I do not see how the proportion in which the two methods are actually mixed can be ascertained by *a priori* inference. Still less do I see how Mr. Spencer is justified in assuming that conduct tending to make "the lives of each and all the greatest possible, alike in length and breadth" is simply identical with conduct of which the "ultimate moral aim" is "gratification, enjoyment, happiness". I think that we may fairly ask him, in any future

[1] *Cf.* pp. 33, 56, 63, 67 among others.

instalment of the present treatise, to give us something more like a proof of the Optimism which is so essential a feature in his ethical construction.

Meanwhile, let us suppose that Pleasure or Happiness has been established—scientifically or otherwise—as the ethical end. Before we come to consider the appropriate means for the realisation of this end, one fundamentally important point remains to be settled, *viz.*, *whose* pleasure we have in view. Is the ultimate aim of Mr. Spencer's Ethics to make pleasure of happiness in general a maximum? or is it rather to advise the individual human being how to gain the greatest possible amount of happiness for himself? Of course these two ends will be to a great extent attained by the same means; and many utilitarians have held that this is altogether the case, and that it is impossible for any individual to attain his own happiness in the greatest possible degree by any conduct other than that which is most conducive to the aggregate happiness of all whom his conduct affects. But in any case the extent to which Egoistic Hedonism and Universalistic Hedonism[1] practically coincide will have to be carefully investigated in a scientific exposition of either system: we have first to settle whether we take the happiness of the individual or happiness generally as the *ultimate* end; and then when our choice is made, there arises a second and quite distinct question in either case—*viz.*, how far this ultimate end will be best attained indirectly by taking the other end as the direct object of pursuit. Now I cannot but think that Mr. Spencer has somewhat confounded these two questions in the chapters (cc. xi.-xiv.) in which he first discusses the claims of "Egoism" and "Altruism," and then proposes a "Compromise" between the two, and an ultimate "Conciliation". For instance, in arguing the case of "Egoism *versus* Altruism," he appears to assume general happiness as an ultimate end, a final criterion by the application of which we are to determine the limits of Egoism as a subordinate practical principle; his contention seems to be merely (to use his own words) that the "pursuit of individual happiness within those limits prescribed by social conditions is the final requisite to the attainment of the greatest general happiness," and that in various ways "diminutions of general happiness are produced by inadequate egoism". On the other hand, in c. xiii., he expressly attacks Bentham and his followers for holding that general happiness should be the ultimate end and final standard of right conduct; and refuses to admit "that from the stand-point of pure reason, the happiness

[1] I venture to adopt my own nomenclature—to which Mr. Spencer does not seem to have any objection.

of others has no less a claim as an object of pursuit for each than personal happiness". But he seems to treat this position as identical with the "theory which makes general happiness the sole [or almost the sole] *immediate* object of pursuit"; a theory very remote from Bentham's—whose practical view was characteristically expressed in the sentence that "self-regard alone will serve for diet, though sympathy is very good for dessert"—and not maintained, so far as I am aware, by any of his leading disciples. And it is only against this latter doctrine, which he more frequently and more properly designates as "pure altruism," that Mr. Spencer's arguments are in any way effective; the issue (as he himself states it) is whether "equitable egoism" or "pure altruism" will produce the "greatest sum of happiness" on the whole; and his conclusion is that "general happiness is to be achieved mainly through the adequate pursuit of their own happiness by individuals"—which, as I have just said, was precisely Bentham's conclusion. I think therefore that Mr. Spencer's apparent antagonism to the Utilitarian school, so far as the ultimate end and standard of morality is concerned, depends on a mere misunderstanding; and that in all this part of his treatise his quarrel is not really with the very sober and guarded "altruism" of Bentham and the Benthamites, but with certain hard sayings of the prophet of the Positivist religion, from whom the term Altruism is taken.

Provisionally, then, I shall conclude that in Mr. Spencer's Ethics the ultimate criterion used in establishing rules of Conduct is Happiness or Pleasure, taken generally.[1] Let us now

[1] I do not wish here to put prominently forward the difficulties that I find in working with the notion of a "sum of pleasures"—difficulties which I have explained at sufficient length in my *Methods of Ethics* (Book II. c. iii). But since Mr. Spencer has referred (in c. ix.) to this part of my treatise, I may perhaps observe that he has not altogether apprehended the scope of my argument. I did not merely urge that in many cases when we try to compare two different pleasures (or pains) we are unable to ascertain which of the two is the greatest. The answer, that we ought to choose the greatest surplus of pleasure *so far as we can ascertain it*, is sufficiently obvious, and if I had meant no more than what can be thus answered, I should not have dwelt so long on the point. But I thought it important to point out further that the very notion of a 'sum of pleasures' implies that the pleasures spoken of are capable of being summed; that is, that they are things quantitatively determinate in respect of their quality as pleasures; and that this assumption, however natural and even irresistible it may be, certainly lacks empirical verification.

I must just add that Mr. Spencer's argument on this point suggests that I am not aware that the objections urged by me against the Hedonistic method apply with even greater force to Universalistic, than they do to Egoistic Hedonism. I certainly thought that I had stated this in the clearest possible language. (*Cf. Meth. of Eth.* B. IV., c. iv., § 1.)

pass to consider his method of scientifically determining the rules themselves.

The apprehension of this method is rendered, I think, more difficult for the reader by the fact that a definite statement of it is given for the first time in the two concluding chapters of the treatise. It is true that the general nature of it has been gradually elucidated in various earlier passages. For instance, its scientific claims are plainly declared in chapter v., on "Ways of judging Conduct"; from which we learn that Mr. Spencer's way of judging it is to be a high priori road. He will not rely on mere generalisation from observation of the actual consequences of different kinds of conduct; it is the defect of current utilitarianism that it does not get beyond these merely empirical generalisations; Mr. Spencer, on the other hand, proposes to "ascertain necessary relations" between actions and their consequences, and so to "deduce from fundamental principles what conduct *must* be detrimental and what conduct *must* be beneficial". Those are brave words, and they will perhaps raise the reader's hopes to the pitch of expecting to find this demonstrated morality in the four chapters that follow, giving respectively the Physical, Biological, Psychological, and Sociological views of conduct. If so, I fear he will be disappointed to learn (c. vi., § 31) that he is to "avoid the tendency" to judge Mr. Spencer's conclusions "by their applicability to humanity as now existing"; and he will be perplexed as to the extent to which he is to avoid this tendency; since a good deal of the discussions in this and the two following chapters plainly relate to human beings that actually exist or have existed. I certainly think that Mr. Spencer ought to draw a clearer line between the actual and the ideal in this part of his treatise; until this is done, it seems to me difficult to criticise these reasonings closely, though they contain much that suggests criticism.

In the concluding chapters, however, these perplexities are cleared away. It is there made quite plain that the rules of conduct, of which Mr. Spencer undertakes to provide a deductive science, are rules that "formulate normal conduct in an ideal society": a society so ideal that in it such conduct will "produce pure pleasure—pleasure unalloyed with pain anywhere". Indeed, in his view, it is only conduct of which the effects are thus unmixed that can be called "absolutely right"; "conduct that has any concomitant of pain, or any painful consequence, is partially wrong". Ethical science, then, is primarily "a system of ideal truths expressing the absolutely right"; and we are to note that it is only this "Absolute Ethics" of which the method rises above the merely empirical procedure, previously condemned as defective; for "Relative Ethics," which has to deal

with all practical questions as to what we ought to do here and now, is "necessarily empirical" in its judgments—at least in all cases that present any difficulty.

The questions then arise (1) How far are we able to form a sufficiently definite conception of the constitution of Mr. Spencer's ideal society to enable us to frame a system of rules for it? and (2) How much guidance would such a system give us in solving the problems of conduct presented by our actual conditions of social life? I have argued against Mr. Spencer's view on these points, in a brief and general way, in my book on the *Methods of Ethics* (B. I., c. ii., § 2). I refer to this passage because Mr. Spencer has replied to me at some length in the present work (c. xv., § 105); but has unfortunately omitted to answer my arguments, owing to a misapprehension which I must now explain. My reasoning was not addressed directly to such a statement of the relation of Absolute and Relative Ethics as I have above endeavoured to abridge from the two last chapters of the treatise before us; what I tried to combat was the far more paradoxical doctrine on the same subject which I found in Mr. Spencer's *Social Statics*. It was there maintained not merely that Absolute Ethics ought to "take precedence of Relative Ethics"; but that Absolute Ethics was the only kind of Ethics with which a philosophical moralist could possibly concern himself. To quote Mr. Spencer's words:—

"The moral law must be the law of the perfect man . . . any proposed system of morals which recognises existing defects, and countenances acts made needful by them, stands self-condemned. . . . Moral law . . . requires as its postulate that human beings be perfect. The philosophical moralist treats solely of the *straight* man. . . . a problem in which a *crooked* man forms one of the elements, is insoluble by him" (c. i.).

Still more definitely is Relative Ethics excluded in the concluding chapter of the same treatise:—

"It will very likely be urged that, whereas the perfect moral code is confessedly beyond the fulfilment of imperfect men, some other code is needful for our present guidance . . . to say that the imperfect man requires a moral code which recognises his imperfection and allows for it, *seems at first sight reasonable. But it is not really so*[2] . . . a system of morals which shall recognise man's present imperfections and allow for them *cannot be devised; and would be useless if it could be devised.*"

I observe that Mr. Spencer, in replying to me, refers to his *Social Statics*, as though he still held the opinions there expressed; but I must confess that I cannot reconcile these passages, and others that might be quoted from the same context, with the view of Relative Ethics given in the concluding chapters of the present treatise. At any rate, it was in opposition to this earlier view and not to the later one that I thought

[2] The italics are mine.

it fair to adduce the analogy of astronomy, and to suggest the absurdity of a 'philosophical astronomer' declining to deal with any planets that did not move in perfect ellipses. Mr. Spencer, in his rejoinder, takes the suggested analogy to relate to the question whether the study of Absolute Ethics should precede that of Relative Ethics. Had this been my meaning, the reference to astronomy would have been manifestly inappropriate. But in fact it was only in the paragraph succeeding that to which Mr. Spencer has replied that I began to discuss this latter question, as is evident from the following sentences with which my second paragraph opens:—

> This inquiry into the morality of an ideal society can therefore be at best but a preliminary investigation, after which the step from the ideal to the actual remains to be taken. We have to ask, then, how far such a preliminary construction seems desirable.

After which I proceed to state my objections to that more moderate view of the claims of Absolute Ethics which is expounded in the treatise before us. These objections Mr. Spencer has not noticed: in fact his interest in my argument seems to have ceased exactly at the point at which it began to be really relevant to his present position. My criticisms, no doubt were tolerably obvious; but as they still appear to me substantially valid, I have nothing to do but to re-state them briefly, with such variations as his present treatise suggests.

In the first place, granting—a large grant—that Mr. Spencer's ideal society, in which the voluntary actions of all the members cause "pleasure unalloyed by pain anywhere" to all who are affected by them, is one which we can conceive as possible, it seems to me quite impossible to ascertain *a priori* the nature of the human beings comprising such a society with sufficient definiteness and certainty to enable us to determine their code of conduct. It has not come within Mr. Spencer's plan to delineate this code in the present treatise, otherwise than in the scantiest and most general way; but among the meagre generalities that he has given us, I can find nothing that is in any degree important which is not also in a high degree disputable. The most important is undoubtedly the formula of Absolute Justice as the fundamental principle for regulating social co-operation. Of this Mr. Spencer, in the concluding chapter, gives the following statement:—

> "Individual life is possible only on condition that each organ is paid for its action by an equivalent of blood, while the organism as a whole obtains from the environment assimilable matters that compensate for its efforts; and the mutual dependence of parts in the social organism necessitates that, alike for its total life and the lives of its units, there similarly shall be maintained a due proportion between returns and labours: the natural relation between work and welfare shall be preserved intact . . .

That principle of equivalence which meets us when we seek its roots in the laws of individual life, involves the idea of *measure;* and on passing to social life, the same principle introduces us to the conception of equity or *equalness*, in the relation of citizens to one another; the elements of the questions arising are *quantitative*, and hence the solutions assume a more scientific form."

Here, in speaking of a "due proportion between returns and labours," Mr. Spencer does not mean merely—as the analogy of the individual organism might lead us to suppose—that each labourer will receive the means of carrying on his labour in the most efficient manner; his meaning is, as several other passages show, that he will receive a share of wealth proportioned to the value of his labour. But so far as this share is more than our ideal labourer needs for labouring efficiently, I see no ground for affirming *a priori* that he will receive it, since it is quite conceivable that the surplus would produce more happiness if distributed among other ideal persons. To this Mr. Spencer would probably answer (*Cf.* c. xi., § 69) that unless "superiority profits by the rewards of superiority" the struggle for existence, to which "the progress of organisation and the reaching of a higher life" have hitherto been due, can no longer continue. This is doubtless a weighty consideration in dealing with the practical problems of existing societies; but I cannot admit its relevancy in "Absolute Ethics," until it is shown how we are to get the advantages of the struggle for existence without their attendant disadvantages, that is, without some pain to those who are defeated in the struggle; for all such pain is *ex hypothesi* excluded from Mr. Spencer's ideal society, in which all voluntary actions produce unalloyed pleasure. Again, I cannot see any validity in the conception of "equalness," as governing the relations of ideal citizens, except so far as it means merely that similar persons will be treated similarly; for we cannot know *a priori* how far our ideal citizens will be dissimilar, and therefore reasonably subjected to dissimilar treatment. The progress of Evolution, Mr. Spencer elsewhere tells us, is to increase heterogeneity; though he nowhere attempts to define the degree of heterogeneity which the ideal society will exhibit. This point is very important in reference to a further question that Mr. Spencer indicates—as to the legitimate ends and limits of government authority. I cannot conceive how this question is to be definitely answered, unless we know in what varying degrees political wisdom is distributed among our more or less heterogeneous ideal citizens; and how can we precisely know this *a priori?*

In short, it seems to me that the imagination which Mr. Spencer has exercised in constructing his ideal society has none of the characteristics of a really scientific imagination; he has

not succeeded in leading us logically to a precise and consistent conception of the mutual relations of the members of this society.

But, secondly, even if it were otherwise—even if we could construct scientifically Mr. Spencer's ideal code, I do not think such a code would be of much avail in solving the practical problems of actual humanity. For a society in which—to take one point only—there is no such thing as punishment, is necessarily a society with its essential structure so unlike our own, that it would be idle to attempt any close imitation of its rules of behaviour. It might possibly be best for us to conform approximately to some of these rules; but this we could only know by examining each particular rule in detail; we could not know it generally and *a priori*. We cannot even affirm that it would be best for us to approximate to it as far as is practicable. For even supposing that this ideal society is ultimately to be realised, it must at any rate be separated from us by a considerable interval of evolution; hence it is not unlikely that the best way of progressing towards it is some other than the apparently directest way, and that we shall reach it more easily if we begin by moving away from it. Whether this is so or not, and to what extent, can only be known by carefully examining the effects of conduct on actual human beings, and inferring their probable effects on the human beings whom we may expect to exist in the proximate future; that is, by the humble and imperfect empirical method which Mr. Spencer may be right in despising, but for which he has not yet provided an efficient substitute.

HENRY SIDGWICK.

V.—DR. WARD ON FREE-WILL.[1]

THERE are in philosophy two well-defined modes or currents of thinking, which give their colour to every doctrine which may be propounded, and mark it with an opposite stamp. One is the striving after analysis, which, applied to subjective phenomena—as it must be applied in philosophy—issues in *meta-*

[1] Articles from the *Dublin Review:* I. April, 1874, "Mr. Mill's Denial of Free-will"; II. July, 1874, "Appendix to Article on Free-will;" III. July, 1876, "Mr. Mill on Causation"; IV. April, 1879, "Free-will." [This article, which could not appear earlier, was written about the same time as Prof. Bain's Note on the subject printed in the last number of MIND. Dr. Ward, though aware that Mr. Hodgson's article was to follow, preferred to reply separately to Prof. Bain—in the Note to be found on some later pages of the present number.—ED.]

physic; the other is the search for some concrete truth or truths of self-evident certainty, from which, when applied to phenomena, a system of minor truths may be deduced, which is the method of *empiricism.* Persons dominated by these opposite tendencies rarely understand each other, for want of perceiving the opposition in the tendency which is latent, while they perceive clearly enough the difference in the results which is patent. And those again who belong to the same tendency, but who are opposed on points of great importance, often misunderstand each other's position for a similar reason, because they do not perceive the sameness of the latent tendency which they have in common.

There is no difference in the method of philosophising more deeply seated or more influential than this. The two tendencies govern the whole field of thought, and the two tendencies are at war. The question is, which of the two is the legitimate master-principle in philosophy—analysis, or deduction from supposed self-evident truths? I say master-principle, because it by no means follows that the victory of either would involve the abolition of the other; it would involve only its subordination, its removal to a subsidiary office. At the same time, it must be allowed that if the empirical principle were the one to yield, its subordination would involve in some cases a change in the character of the truths which it propounds—namely, where it propounds them as of *absolute* authority.

Tried by this test, confronted by this distinction of fundamental tendencies, the most pronounced opposites must often shift places and stand shoulder to shoulder. *Phenomenist* and *Intuitionist* are no longer such utter irreconcilables as they seem, but sometimes have a deeper union in common—namely, in those cases where they both belong to the empirical tendency. Mill and Dr. Ward may shake hands there. Both are empiricists, but the entities of the one are objects of sensible experience, those of the other of supra-sensible intuition. The disciple of Mill denies the self-evidence of phenomena given by intuition, and appeals to phenomena given by experience; but this is not the same thing as appealing to *analysis;* that is, to analysis of both kinds of phenomena alike. Some concrete, unanalysed, experience is what the disciple of Mill seeks as a basis on which to rear his system. And this method, which is doubtless the true method in science, the intuitionist extends to philosophy, while phenomenists of the Mill school deny the supposed experience of the intuitionist, his necessary intuitive truths, in the introspective domain. Between them there is a difference as to facts, but none as to method. On the other hand, there are some phenomenists who would come very near

indeed to Dr. Ward's intuitionism in results, though in method divergent as the poles.

But of all this Dr. Ward betrays not the smallest inkling. To him phenomenism is the fundamental antithesis of intuitionism, as darkness of light, or evil of good. It never occurs to him that there are phenomenists and phenomenists; nor even, what is stranger, that there are intuitionists and intuitionists. He proceeds in the good old way to demonstrate the existence of God, as if Spinoza had not long ago exhausted the possibilities of the ontologico-empirical method in that direction. In the presence of phenomenism and Mill, a re-statement of the scholastic demonstration of God's existence becomes, he thinks, the most pressing need of the time (April, 1879, p. 1).

Of this demonstration those articles from the *Dublin Review* which contain the demonstration of Free-will, and which are those named at the head of this paper, are intended to form a part. Reprints of these articles are now before me, sent me by the kind courtesy of the author. In return for which, I now propose, what I am sure he will approve, to break a friendly lance with the fair-minded author, by doing my best to show that not a stick or stone of the demonstration will hold together when brought to the test of analysis. What Dr. Ward will probably not believe is, that I see no difference in essentials—that is, as a matter of practical belief influencing conduct, between his view of Free-will and my own. That the law of liberty is the highest law there is, *Libertas suprema lex*, has long been a favourite saying of mine. But I do not on that account oppose liberty antithetically to necessity. There is an inner necessity of a man's nature, as well as an external necessity acting upon him from his environment; and the action of that inner necessity is his liberty. Liberty is a mode of necessity, and its true name is *self-determination*. Dr. Ward's demonstration may fall away, yet leave *this* liberty intact; and *this* liberty it is which, describe it as we may, theorise about it as we will, is the one common kernel of the matter, held by us both alike.

But why do I say that Dr. Ward will probably not believe this? Because to believe it on both sides would be to put an end, *pro tanto*, to the controversy. Both would then see that they were contending only *nominally* about free-will, but *really* about something very different. If the practical freedom of man, his power of self-determination with its corollaries—namely, his moral responsibility and the moral government of the world—were admitted to be as much consequences of determinism as of indeterminism, the free-will controversy would appear in its true shape and colours. That controversy is now kept alive on false suppositions. The real subject of dispute is

not whether man is a free agent, but what school of thought shall have the credit of best assuring the doctrine that he is so. Not the catholic truth of free-will, but the truth about free-will as held by the Catholics, is the subject of dispute. Now the truth about free-will as held by the Catholics is what I venture to think is no truth at all, and what Dr. Ward has devoted the articles before us to demonstrate.

In fact, the phrase *freedom of the will* is ambiguous, and covers two very different doctrines. As it is commonly understood by controversialists, and by Dr. Ward among others, it means that the will is free with a freedom antithetically, or with mutual exclusion, opposed to necessity; some acts being entirely free without admixture of necessity, and others entirely necessitated without admixture of freedom. This *separation* of freedom and necessity is empirical, cannot be intelligibly construed to thought, and therefore renders the freedom of the will unthinkable and illusory. So far from freedom and necessity being properties attached, one to this act, one to that, they are *characters*, both of which attach to every free act according to the point of view from which you regard it. Accordingly, in the other and true sense of the phrase *freedom of the will*, freedom means the action and re-action of motives on each other within the mind, not fettered by external constraint, but free to exert each its own kind and degree of energy. This exertion is freedom; and thus a free act of the mind is one which is wholly necessitated when you look at its *factors*, and wholly free when you look at their *action*; while from the point of view of the agent, the act is one of self-determination. Since this is the only way in which freedom can be intelligibly construed to thought, it follows that those who oppose the doctrine of freedom, as it is commonly and empirically understood by controversialists, are the firmest upholders of the freedom of the will in its intelligible, real, and practical significance; which is also the sense in which it is understood by mankind at large.

I.

The doctrine of Free-will according to Dr. Ward consists of two branches, the first being the doctrine of Indeterminism, the second a doctrine of the Causation of human acts. The first he calls a psychological, the second a metaphysical doctrine (April, 1874, pp. 2, 22; April, 1879, p. 30). The first is treated at length in the article of April, 1874, and the Appendix, July, 1874. The second is treated in the article on "Causation," July, 1876. And the final article on "Free-will," April, 1879,

sums up the results of both. In July, 1876, p. 8, Dr. Ward thus expounds his position :—

"The establishment of this truth" [of Free-will] "against phenomenists required the establishment of two conclusions, one psychological and the other metaphysical. Phenomenists allege as a matter of experience (to use Mr. Mill's words) that 'volitions follow determinate moral antecedents with the same uniformity and the same certainty as physical effects follow their physical cause'. This is the tenet of determinism. We argued against it in April, 1874 ; and supplemented our reasoning by some further remarks in our following number. We called our own adverse position by the name 'indeterminism'; being the purely negative position, that volitions are *not* certainly determined by psychical antecedents. But free-will includes another doctrine besides that of indeterminism ; it includes the doctrine that man is a self-determining cause of volition. And this proposition of course cannot be treated until we have considered the question of causation."

These then being the lines laid down by Dr. Ward for the treatment of the whole question, upon these I will now follow him, premising however that I by no means adopt his use of the term *metaphysical*, where I should say *psychological*, or (in case of Dr. Ward's theory being proved) *ontological*. But apart from this, nothing can be clearer or more convenient than the division which he has adopted. First comes the psychological question (as he calls it) of *fact*. Is "the will's course of action infallibly and inevitably determined at every moment by the circumstances—(1) internal (2) external—of that moment"? (April, 1879, p. 30. See also April, 1874, p. 10, note ; and July, 1874, p. 14.) Secondly, if this is not the fact, what is the determinant of the will's course in those cases where it is not determined either by circumstances within or by circumstances without the agent ; or, in Dr. Ward's phrase, what is "the proximate cause of free acts of the will"? (April, 1879, p. 36.)

Though Dr. Ward calls his first position a purely negative one, in the sense of its being negative of Determinism (April, 1879, p. 30), the facts which he alleges are positive enough: "the Determinist's theory is, that no man resists his strongest present impulse ; and his theory therefore is conclusively and finally refuted, if it be shown that any one man—and much more if it be shown that a large class of men—do often resist their strongest present impulse" (April, 1879, p. 22). Nothing can be more positive, and, as he declares, more aggressive, than his whole line of argument (*ib.*, p. 17). He brings a long array of well chosen cases to prove, no negative point, but a positive fact, that the course of the will's action is often in opposition to the man's strongest present impulse. He rests his whole case, in the first branch of his argument, upon his proof of this fact. The whole deterministic controversy, he says, turns on one question, "which is simply and precisely this: Do men ever resist a real desire? Is there such a thing as self-restraint?".

"To answer it in the affirmative is to reject determinism in every possible shape" (July, 1874, p. 13; and again, quoting the former passage, April, 1879, p. 12).

Now, when one hears that the whole deterministic controversy turns on the question whether there is or is not such a thing as self-restraint, one begins to suspect that some egregious misunderstanding of the terms employed, on one side or on the other, must be mixed up in the matter. Do Dr. Ward's elaborately stated cases come to this, that the exercise of self-restraint is a fact? Yes, to this and nothing else. For instance, one of his most striking cases is that of a young man who has been warned by his dentist to brush his teeth carefully every morning. But one day he is in a great hurry to get his breakfast over and go out hunting. He is on the point of disregarding the dentist's advice; "nevertheless—to use an equestrian simile such as he would himself love—he pulls himself up, and reins himself in; he dwells on the thoughts which are so clearly and distinctly in his mind, until they become vivid, and the balance of attraction is changed to the opposite side. *Determinists say that such a case as this never happens; that the laws of human nature forbid it.* Will any candid enquirer on reflection endorse their dictum?" (April, 1874, p. 14.)

The italics are mine. Easy indeed would be the refutation of determinism, if it were refuted by the existence of so simple a case as this. I therefore look, in the first place, for some misunderstanding, on one side or the other, of the terms in which it is stated; and it seems to be this. In the words "*he dwells* on the thoughts," Dr. Ward, I imagine, emphasises the italicised words, so as to mark that the movement of thought *originates* with *him*. Determinists would read them without emphasis, as a true description of *what takes place in his consciousness* at the moment of the turning of the balance from hunting to tooth-brushing. There are two attractions, hunting and tooth-brushing, soliciting his attention with varying degrees of energy, and at a certain moment one of these begins decisively to preponderate. What Dr. Ward must, I think, mean then by saying that determinists deny the possibility of such a case is, that they deny what he understands, his *subauditur*, in the words "*he dwells* on the thought," namely, the agent's origination of the decision—or, as he might say, deny that the restraint is *self*-restraint.

But even with this explanation we are not at the end of the disagreement. It is *self*-restraint as much on their reading of the words as on his. The whole balancing and decision takes place in the agent's consciousness, and therefore the decision is *his* decision, and the restraint *self*-restraint. The agent is soli-

cited by opposite attractions, the decision depends on his state of mind, his *internal* circumstances re-acting on the opposing attractions, the *external* circumstances. The thought of the dignity of keeping to a good resolution is, we may imagine, the particular internal circumstance which re-inforces the external attraction of the future benefit to be derived from the otherwise irksome tooth-brushing.

This reading of the story in the determinist sense will not, however, satisfy the indeterminist. He requires a cause beyond the preponderance of one external attraction over another when aided by the attraction of some internal circumstance. He will say, perhaps, that internal circumstances, states of mind, and so on, are not the agent *himself*; and will ask farther what decides that such and such an internal circumstance shall come into play here and now, and with this or that precise degree of force? He will urge that, if the determinist's reading were true, we ought not to say "he dwells on the thought," but rather, "the thought dwells on him". The agent himself, he will conclude, cannot be ignored.

What has the determinist to say in reply? This, that his own way of reading the above description includes and fully expresses all the *facts* of the case, but that the indeterminist's reading of it introduces into the facts the notion of causation, and the assertion of a cause of the fact of decision, which is not an observed fact, but, if it exists, belongs to the second branch of the whole question of free-will, as distinguished by Dr. Ward himself. To emphasise the "*he dwells* on the thought" is to import into the facts as observed a supposed, but not observed, *cause* of the direction those facts are observed to take. The determinist denies, and the indeterminist asserts, that the "he," the agent himself *apart from his internal condition at the time*, is a fact observable in cases of free choice. "It is a matter of direct, unmistakable, clamorous consciousness, that during those periods" [of resistance to impulse] "it is my own soul and no external agency, which is putting forth active and sustained anti-impulsive effort" (April, 1879, p. 39). Here Dr. Ward lays claim to an immediate knowledge not only of the *facts* of choice, but of the *cause* governing the facts. To make his testimony as to what the facts are quite complete, he ought to have added to the words "my own soul and no external agency" the further words, *and no internal circumstance or state of my soul;* as otherwise he does not fully deny the determinist's statement that internal circumstances concur in the result.

Still it is clear that Dr. Ward claims to have an immediate knowledge of the agent, or soul, *per se*, in cases of conscious anti-impulsive effort, and claims it as an essential part of the facts of

which anti-impulsive effort consists. But the existence of *this* knowledge requires proof, and no proof has he supplied; indeed, he has not even distinguished the fact of which proof is required from the other facts which go to constitute an anti-impulsive effort in the cases which he describes. He huddles it up with those facts in describing them, and then at last emphasises it, as if it had been distinctly described, when he comes to account for their causation. Yet I should have thought it was almost a truism at the present day, that we have no direct knowledge or intuition of our soul *per se*, apart from the states of consciousness which we attribute to it, and which are the "internal circumstances" of the determinists. If, however, Dr. Ward thinks, as he plainly does, that we have such an immediate knowledge of the soul *per se*, it ought to have been expressly described in describing the cases of anti-impulsive effort in which the knowledge is obtained; and then it would have ranked (of course for what it was worth) among the *facts* of the case. As it is, it is only an hypothesis accounting for the facts, and one the value of which must be discussed, not now, but when we come to the second branch of the argument. The facts as Dr. Ward describes them, in all the cases of anti-impulsive effort which he gives, are perfectly compatible with determinism.

But before going farther, it will be best to state more explicitly what Dr. Ward's theory precisely is, what precisely he considers that his instances prove. And again, in order to do this, some very important differences in the use of terms must be mentioned, which Dr. Ward himself points out, and insists upon as requisite to the understanding of his theory.

Chief among these is the use of the term *motive*, which with Dr. Ward means, not as with determinists, and I believe usually, spring of action, felt attraction or aversion—but *resolve;* so that my resolve to follow a certain line of conduct is, according to him, my *motive* for doing a particular action; whereas motive usually means the pleasure or advantage I expect to get, the pain or disadvantage I expect to avoid, by doing that action. These Dr. Ward calls, not motives, but *attractions* positive or negative.

"We will adopt therefore the word 'attraction,' in a very similar sense to that which determinists express by the term 'motive'. We will call by the name of an 'attraction' every thought which proposes some pleasure, positive or negative, to be gained by some act or course of action; and we will call one attraction stronger than another, if the pleasure proposed by the former is apprehended as greater,—is more attractive at the moment,—than that proposed by the latter" (April, 1874, p. 8).

Accordingly by "ultimate motive" in a course of action, Dr. Ward means my "resolve of pursuing some absolute end or ends, with a view to obtaining which I begin and continue that

course of action. And what an 'ultimate motive' is in relation to an *absolute* end or ends, precisely that is an 'immediate' or 'intermediate' motive in relation to a *relative* end or ends" (April, 1874, p. 10). Here the end or ends desired would be called the *motives* by determinists, and not the resolve to pursue them.

I will not stop here to do more than point out how entirely destitute this use of the word *motive* for *resolve* leaves us, when we inquire how resolves themselves are formed. And yet everything may turn upon the answer to that question. According to the usage of determinists, all acts, including internal acts of resolve, spring from motives; according to that of indeterminists, resolves are the one kind of acts which cannot spring from motives, whatever else they may spring from. The term *motive*, in their use of it, ceases to be applicable to the *formation* of resolves, a process which their terminology leaves in its native obscurity.

In accordance with the foregoing explanation, the terms *desire*, *attraction*, and *pleasure*, are used by Dr. Ward in a far more restricted sense than by determinists. By determinists they are applied to ends or purposes of all kinds, as co-extensive with imagined good or *bonum* generally; but by Dr. Ward they are restricted to one kind of good, pleasure as opposed to virtue, *bonum delectabile* as opposed to *bonum honestum*. Yet *bona* belonging to either class may be the objects of resolves (April, 1874, p. 11). It would seem, then, that a good thing may be the object of a resolve, without having any attractive power on the will,—a psychological impossibility.

The next difference in terms is more important still, inasmuch as it is not merely a matter of terminology, but introduces, by giving a technical name to it, a new or at least peculiar distribution of the subject-matter; it is part of the analysis as well as of the nomenclature. I mean what Dr. Ward calls the "definite and decisive spontaneous impulse of the will"; by which he means the *resultant* direction of the will, the impulse resulting from the conflict of all the attractions in play at the time. How far Mill's or Professor Bain's language may have lent itself to the singularity of calling a *resultant* direction *spontaneous*, I will not stop to ask. Whatever is purely matter of terminology is comparatively unimportant. But that the phenomena of volition should be cut up and parcelled out by a phrase of this kind, as if the existence of a corresponding fact was matter of notoriety, is logically monstrous. The assumption of a fact is here involved in the invention of a phrase.

Dr. Ward is in fact assuming thereby that all the attractions, pleasures, or desires, all the *bona delectabilia* which the case may

admit of, act together and at once, without admixture from any conflicting *bonum honestum*, and result in an impulse which is thus determined solely by the balance of pleasurableness. Then comes in, in some cases, the resistance of some *bonum honestum*, and by a *resolve* turns the balance the other way. Now this analysis of the facts in cases of volition is perfectly arbitrary. It recalls the wish of the Roman worthy, that all Romans had but one neck, that he might behead them at a blow. Facts, however, are too stubborn to dispose themselves so obligingly. The *bona honesta* as well as the *delectabilia* must logically be counted among the contributories to the resultant. Which is what the determinists mean by saying that the resultant is inevitably determined by the motives, motives meaning with them *all* the attractions; and that the "resolve of pursuing some absolute end," which is Dr. Ward's definition of an "ultimate motive," is synonymous with "the desire of some preponderating pleasure," pleasure meaning with them good of *every* kind; though I cannot let this latter statement pass as in all respects representing their meaning. A resolve is not strictly the same thing as a desire; it is rather *the turning* of the balance in favour of a preponderating desire; the action induced by the greater strength of the desire, not the greater strength itself. And what precisely happens at this moment of turning of the balance, or what is the true analysis of that moment's content, *this* it is which is the real question of Free-will.

Two important discrepancies, then, have now been signalised between what I may call Dr. Ward's and the determinists' preparation of the facts for analysis, between their several modes of stating the problem. The first is the claim by Dr. Ward to have a supposed immediate self-perception of the agent *per se*, at the moment of resolve or turning of the balance, included among the *facts* of the case, which they would deny; the second is Dr. Ward's assumption that the facts constituting cases of volition marshal themselves in such a manner, that actions which are led up to by attractions balance themselves *first*, and result in a "spontaneous impulse of the will," and *then* actions which are not led up to by attractions, but spring from resolves, in some cases overpower and reverse this spontaneous impulse, which Dr. Ward calls the will's "anti-impulsive action". It is with the latter of these discrepancies that we have to do now, in the first branch of the argument; we have in fact to consider whether there is any such difference in mode of origin between the actions which Dr. Ward says are led up to by *attractions*, and those which he says spring from *resolves*, as to warrant us in making them into two naturally antagonistic classes, *impulsive* and *anti-impulsive*. Determinists contend that, whatever may

be the analysis of the moment of turning of the balance, resolves themselves of *all* kinds are led up to by attractions of some kind or other, and consequently that Dr. Ward's distinction between impulsive and anti-impulsive action is arbitrary; the analysis of all volitions being alike in this, that they are led up to by desires, decided by resolves, and carried out by actions consequent on resolves.

Let us now hear Dr. Ward's own statement of his theory (April, 1874, p. 9):—

"We beg our readers then to fix their attention on that definite and decisive spontaneous impulse of the will, which is so very common a phenomenon, and to which we have so often referred. We entirely agree with Mr. Mill, as we just now said, that this spontaneous impulse of the will is infallibly determined at each particular moment, by the balance of pleasureableness as apprehended at that moment." [Dr. Ward explains in a note that the way in which, as he agrees, the will's spontaneous impulse is *formed*, namely, by the balance of pleasure, is quite unessential to his own argument, which turns solely on the question, whether it is ever *resisted*.] "But the whole deterministic argument rests from beginning to end on the assumption, that men *never resist this spontaneous impulse:* whereas we confidently affirm, as an experienced fact, that there are cases of such resistance—numerous, unmistakable, nay, most striking. What we allege to be a fact of indubitable experience is this. At some given moment, my will's *gravitation*, as it may be called, or spontaneous impulse is in some given direction; insomuch that if I held myself *passively*,—if I let my will alone—it would with absolute certainty move accordingly: but *in fact* I exert myself with more or less vigour to *resist* such impulse; and then the action of my will is in a different, often an entirely opposite direction. In other words, we would draw our readers' attention to the frequently occurring simultaneous existence of two very distinct phenomena. On the one hand (1) my will's gravitation or spontaneous impulse is strongly in one direction; while on the other hand at the same moment (2) its actual movement is quite divergent from this. Now that which '*motives*' [in the determinists' sense] affect, is most evidently the will's spontaneous inclination, impulse, gravitation. The determinist then, by saying that the will's movement is infallibly determined by 'motives,' is obliged to say that the will never moves in opposition to its spontaneous impulse. And in fact he does say this. All determinists assume as a matter of course, that the will never puts forth effort, for the purpose of resisting its spontaneous impulse. We on the contrary allege, that there is no mental fact more undeniable, than the frequent putting forth of such effort."

Take another passage from the same article, p. 11:—

"We have already expressed our conviction, that at any given moment the will's spontaneous impulse (of which we have said so much) is infallibly determined by the preponderance of pleasure proposed. The thought of this preponderating pleasure may be called the 'preponderating attraction,' or 'the resultant of co-existing attractions'. Again we have often to speak of the will's 'spontaneous impulse': this we will sometimes call the will's 'preponderating' impulse; or, for brevity's sake, we may omit the adjective altogether, and speak of the will's 'impulse'. Resistance to this impulse may be called 'anti-impulsive effort' issuing in 'anti-impulsive action'."

Dr. Ward does not pass quite dry-shod over the question,

What determines the resistance to the will's spontaneous impulse? But his answer is of such a character as almost to surrender his whole contention. In the same article of April, 1874, p. 21, we read :—

"One further question remains to be asked. What are the *motives* which actuate a man, when he resists his will's spontaneous impulse? In every instance, by far the easiest course is to act in *response* to that impulse: and no one will take the trouble of resisting it, except for some unmistakably worthy motive; some clear dictate of reason. There are two and two only classes of motives, which occur to our mind as adequate to the purpose. First, there is the resolve of doing what is right. . . . Another motive, which often suggests itself, is my desire of promoting my permanent happiness, in the next world or even in this. . . . It is an observed phenomenon, we contend, that men do at times resist the spontaneous impulse of their will, when induced so to do by one or other of these two classes of motives: but where such motives are away, it seems to us a matter of course, that every one is always led by his predominating attraction."

To the last sentence Dr. Ward appends the following footnote :—

"We do not of course for a moment deny that determinists include both the pleasureableness of virtue and the pleasureableness of promoting a man's own permanent interest among the attractions which influence his will. But it is a matter of every-day experience that the pleasureableness of this or that immediate gratification is more attractive than these at some given moment. And what we allege is, that men not unfrequently resist such preponderating attraction, for the sake of practising virtue or of promoting their own permanent interest."

Not enough, I reply. Not enough, without adding to the last dozen words these further ones, *as distinguished from the pleasure of practising or promoting them.* This is what Dr. Ward must show, or fall into the determinists' position, which is, that the purpose of practising virtue or of promoting their own permanent interest *is* the preponderating attraction in these cases. And what can the indeterminists rejoin? Are virtue and self-interest such *thoroughly unpleasant* things that the pursuit of them can in no degree be owing to their attractiveness? Yet if some tinge of attractiveness is theirs, then, on Dr. Ward's principles, they must *pro tanto* be contributories to the resultant spontaneous impulse of the will; which nevertheless, as motives of its anti-impulsive action, they resist. Their position in the economy of volition is then a truly critical one; they are divided against themselves; they resist in one character what they contribute to form in another. The line which separates Dr. Ward from the determinists is in this place narrow indeed, and to me, I confess, invisible.

The sole difference is a purely arbitrary one introduced by Dr. Ward. Determinists, as he shows by quoting from Mill and Prof. Bain (April, 1874, p. 4, note, and again April, 1879,

pp. 14, 15), mean by strongest motive strongest *in relation to pleasure and pain*, and not merely strongest *in relation to the will*. By quoting them Dr. Ward merely means to keep them to their affirmation. Attractions of *all* kinds being included by them under the term motives, they allege that those which are stronger in relation to pleasure and pain are *also* stronger in relation to the will, and that, when any motive has proved stronger in relation to the will, we are entitled to *infer* that it was the stronger in relation to pleasure and pain. For we have, in many cases, no other means of testing the comparative strength of nearly-balanced attractions, in relation to pleasure and pain, than the observation of their strength in relation to the will, as shown by the decision of an act of choice. This, however, is not an *assumption* on the part of determinists, but is part of their theory of the case, founded on the innumerable instances in which not only pleasure is an undoubted motive power, but in which pleasures already known as *greater* are found to be *stronger* than pleasures already known as less; cases which, as they allege, are uncontradicted by any proved counter instances.

Dr. Ward, on the other hand, assumes an arbitrary and empirical distinction between attractions; two classes of them, namely, those of virtue and permanent self-interest, he sets apart from the rest, and opposes them to *pleasurable* attractions, under the title of resolves to resist impulse; as if they too had not a pleasure of their own, often very intense and in most cases very abiding. So that the force which they exert on the will comes in many cases rather from the permanence of an abiding latent thought, ready to spring forward into distinct consciousness in intervals of reflection, than from a transitory keenness in affecting the sensibility. The consciousness that yielding to some attraction will ruin the permanent and pleasurable sense of self-respect or peace of mind, will often drive out the attraction and occupy in its room. Sometimes it acts by embittering or enfeebling the attraction, sometimes by setting up a counter attraction, but in both cases it is pleasurable. On one side, then, is a certain vividness and pungency, on the other a *staying* power; but the pleasures which have a staying power are still pleasures, though of a different kind. And in judging the comparative strength of disparate pleasures such as these, often the only way open to us is to see which of the two is actually obeyed at the moment of choice. It is often unknown to the chooser himself till his own choice enlightens him. It is in this moment of ignorance, previous to choice, that he has that sense of being able to choose which is called the *sense of freedom;* and from that moment it is that what he *is* manifests itself in what he *does*.

Let us now take one of Dr. Ward's clear and, I must say, admirably stated instances; it shall be taken from the Appendix of July, 1874, which is chiefly devoted to instances, and one which he evidently thinks clear and decisive (p. 9):—

"Our next illustration shall be for the purpose of explaining, that the present issue does not turn at all on the question whether *effort* is put forth by the agent, but only *anti-impulsive* effort. With this view we will recur in the first instance to the illustration which we derived (April, 1874, pp. 3, 4) from the demeanour in battle of some courageous soldier. He will often put forth intense effort; brave appalling perils; confront the risk of an agonising death. But to what end is this effort directed? He puts it forth in order that he may act in full accordance with his spontaneous impulse; that he may gratify what is his strongest wish, his real desire: in order that he may overcome the enemy, obtain fame and distinction, avoid the reproach of cowardice, &c., &c. Such efforts as these we may call 'congenial' efforts. But now take the instance of a military officer—possessing real piety and stedfastly purposing to grow therein—who receives at the hand of a brother officer some stinging and (as the world would say) 'intolerable' insult. His nature flames forth; his spontaneous impulse, his real present desire, is to inflict some retaliation, which shall at least deliver him from the 'reproach' of cowardice. Nevertheless it is his firm resolve, by God's grace, to comport himself Christianly. His resolve contends vigorously against his desire, until the latter is brought into harmony with his principles. Here then are two cases, which agree with each other as being cases of intense effort; but the former is 'congenial' effort, while the latter is 'anti-impulsive'. What is most remarkable in the last named officer is his 'self-restraint'; but it would be simply absurd to talk of self-restraint in the former instance. No one, who considers ever so little, can overlook the fundamental contrast between the two cases."

Yes, it is a very decided contrast. But it is not fundamental in respect of the nature of volition, and proves nothing whatever in favour of Dr. Ward's analysis of acts of choice. The "last-named officer" overcomes a real desire, but how? By a stronger desire. He opposes a desire which is in process of becoming a resolve by a desire which has already become one; opposes a new desire which derives its strength from its vividness by an old desire which derives its strength from its fixity. The same may be said of all the instances given by Dr. Ward in this Appendix.

Take his instance of a boy who is supposed to decide against running away from a school, at which he is miserable, on three sorts of grounds. First, he may represent to himself that home will, under the circumstances, not be pleasant; this, says Dr. Ward, is a case of counter-attraction, his real desire now is to remain at school, and he remains. Secondly, he may consider that remaining will be more in accordance with the will of God, which is an attraction to him in consequence of his early training; this, too, changes his real desire, makes it a desire of remaining, and he remains. But thirdly, from the motive, or resolve, of virtue and permanent self-interest, he sets himself to

resist that which is his spontaneous impulse and real desire, namely, to leave school; and remains, though against his real desire. "Here," says Dr. Ward, "is a case in which self-restraint really does come in." The state of struggle while it lasts is "most unmistakably heterogeneous from that which we last described," that is, from the second case. Yes, different from it no doubt; but to this extent only, that the thought of virtue and permanent self-interest has (1) a different kind of attractiveness from that of obedience to the will of God, which in the case supposed has already become pleasant; and (2) has a different kind of attractiveness from that of quitting school, an attractiveness owing to its fixity, and not to its vividness.

"The cases," says Dr. Ward in a footnote to p. 11, "the cases on which we insist are those, in which I *resolve* and *act* in direct opposition to what (at the very moment of acting) I *desire*. The undeniable existence of such cases is the fact, on which we rest as fatal to determinism." Observe, *at the very moment of acting*; thus precluding the possible misconception, that cases in which a new attraction preponderates over a prior one, thus changing my desire of one moment into a new desire of the next moment, are the cases he insists upon. There are cases, says Dr. Ward, in which we resolve and act in direct opposition to what at that very moment we desire. Is this true? Certainly not, in my opinion, and as I think I have sufficiently shown. In these cases, what we *most desire*, at the very moment of choice, is to do our *painful duty*.

Dr. Ward, it will be noticed, adopts as the fact from which he reasons, the one complex moment of conflict between impulse and anti-impulsive effort; expressly excluding from that moment the consideration of its antecedents. This one complex moment of conflict, he argues, shows that the soul puts forth a *free* power, namely, in those cases where the anti-impulsive effort is victorious. But I would ask,—If he excludes from consideration the antecedents of the moment of conflict, how does he know that it is the *soul* which puts forth the anti-impulsive effort? For, taking it so, the *soul's* putting forth the effort is an inference, not an observation; and the observation of the moment of conflict alone carries us no farther than to the *sense of freedom*, which is admitted on all hands to be a fact. If on the other hand the antecedents are taken into account, then experience shows that the soul's anti-impulsive effort is as much dependent on antecedents, though not perhaps on the same antecedents, as the spontaneous impulse. Dr. Ward's reply must be, as shown above, that we have an immediate intuition of the soul *per se*, in the very moment of conflict. And to this I now make the further reply, that this *alone* is not a sufficient premiss from which

directly to deduce its freedom. It is necessary *also* to maintain an intuition of it as an agent *which acts independently of antecedents* in the moment of conflicts; which would be an intuition at variance with all experience, as I have endeavoured to show. Dr. Ward is thus driven to rest his case for freedom on the assertion, that we have, in the moment of conflict, an immediate intuition of the soul as a free agent, which is no more than supposing his case proved by stating that he knows it to be true.

II.

Having now shown the utter fallaciousness of Dr. Ward's exposition of the *facts* which are observed in cases of volition, on which his entire disproof of determinism depends, I proceed in the next place to the second branch, the causation branch, of his argument. And the first remark I have to make is this, that the only circumstance which makes any *special* theory of causation requisite is that same fallacious diagnosis of the facts, which has been already exposed. There is, according to Dr. Ward, a remarkable phenomenon, of a very special kind, called anti-impulsive effort. How, then, does this come to pass, how is it to be accounted for? If it were of a piece with the other phenomena of volition, as the determinists maintain, it would require no special and peculiar causative agency to be introduced to explain it; the same theory of causation, whatever it might be, would serve for all. It appears, therefore, that the whole of Dr. Ward's second branch of the argument, his theory of causation, serves but to explain an anomaly arising from his fallacious diagnosis of facts in his first branch. It is his way of solving his own self-created difficulty, solving it, as we shall see, by greater difficulties.

The full doctrine of Free-will, which is Dr. Ward's conclusion, may be best seen in connexion with both branches of his argument, from an illustration which he gives near the end of his final article of April, 1879, p. 43 :—

"I am walking for health's sake in my grounds on a bitterly cold day. My strongest present desire is to be back comfortably in the warm house; but I persistently refuse to gratify that desire; remembering the great importance of a good walk, not only for my general health, but for my evening's comfort and my night's sleep. Plainly, according to the Jesuit definition" ["*Potentia libera est ea quæ, positis omnibus requisitis ad agendum, potest agere et non agere,*" quoted p. 42] "my will acts with perfect freedom. My present action is resistance to my strongest present desire; and I have full proximate power to abstain, if I choose, from the continuance of this action, by resolving to go indoors. But no less plainly this act is free, according to that definition of Free-will which *we ourselves* set forth" ["*Libertas est ea indifferentia activa agentis, quâ, positis omnibus ad agendum requisitis, potest agere et non agere,*" quoted from F. Palmieri, p. 42]. "My soul and body, co-operating as blind causes, generate my preponderating

spontaneous impulse towards going indoors ; while my soul, acting as an originative cause, generates my continued *resistance* to that preponderating spontaneous impulse.

"Conversely. I am sitting over the fire, with a novel in my hand ; and my strongest present desire is to continue in my present position. I remember, indeed, that nothing in a small way can well be worse for me, and that I shall pay dearly for my self-indulgence. *Video meliora proboque : deteriora sequor*, and I stay just as I am. Here again, according to the Jesuit definition, I am undeniably free ; for I am entirely able, without any further *requisita ad agendum*, either to continue my self-indulgent action or to abstain from it. And here again my freedom is equally manifest, according to *our own* definition of freedom. True, indeed, my soul is not at this moment acting as an originative cause ; but it has the *proximate power* of so acting if it pleases."

Here, then, we have the whole *modus operandi* outlined, and the theory accounting for the facts, as exhibited previously, may accordingly be stated somewhat as follows. The soul of man is a cause, or causal agent, which is free, that is, has the power of acting or abstaining, every other requisite for action being presupposed. Farther, it is an *originative* and not merely a "blind" cause, like physical bodies, *e.g.*, the sun ; though in regard to one class of its effects, namely, those in which it acts jointly with the body, it is a blind cause, acting with the strictest necessity (April, 1879, pp. 37, 38). Its freedom depends on its being also an *originative* cause, for "the notion of freedom is included in the notion of an originative cause" (*ib.*, p. 40). And being an originative cause, it must also be an *intelligent* one (*ib.*, p. 38). From the long passage just quoted it also appears, that the spontaneous impulse of the will is caused by the joint action of the soul and the body, while its anti-impulsive action is due to the soul alone, acting as an originative cause. Two other remarks of Dr. Ward's will complete the picture. "Firstly, when *the will* is said to act, this is a mere figure of speech ; for it is the *soul* which acts. Secondly, when the soul is said 'to act,' the immediate reference is to its own *internal* action ; whether or no that internal action be the *resolving* on, nay the immediately *commanding* of, some external act." (*Ib.*, p. 42.)

Such, briefly, but I trust sufficiently stated, is the theory which Dr. Ward undertakes to prove. Everything in it turns on the existence and nature of the "soul," for on its agency alone does free anti-impulsive action depend. What, then, is Dr. Ward's conception of the nature of the soul, and what is his proof of its existence ? These are points which require treating, on his part, with the greatest care and thoroughness, for they are the basis of his whole theory.

Yet it is precisely on these points that the critic's work is lightest. He has only to indicate *lacunæ*. Dr. Ward supplies no proof at all that the soul, as he conceives it, exists ; and no

evidence that his conception of its nature and powers is a true conception.

It is true that he *imagines* that he has done so. He imagines, no doubt, that he puts in evidence of the existence and powers *of the soul*, when he says, in a passage already quoted and criticised, "It is a matter of direct, unmistakable, clamorous consciousness, that during those periods" [of resistance to impulse] "it is my own soul and no external agency, which is putting forth active and sustained anti-impulsive effort" (April, 1879, p. 39). But this is a very different thing from having such a perception of the soul *per se*, its nature, and powers, as will serve for the basis of an explanatory theory. For such a basis we want proof of the existence and nature of the soul *per se*; not, as in the passage quoted, of the soul and its actions mixed up together. That may serve as a *description*, a preliminary description, of the things to be explained, but not as a proof of the causes explaining them.

Has, then, Dr. Ward no notion whatever of the soul *per se?* O yes, he has one which he throws in by the way, as an *obiter dictum:* "It is implied, we may add, in their" [the intuitionists'] "whole notion of a 'cause,' that a cause must be one or other *substance*. When they mention the influx of my volition into some blow which I deal forth, they would thus explain their meaning in detail. The blow is nothing else than a certain movement of my closed hand. The cause of that movement is my soul; which addresses, if we may so speak, to my hand that command, which is called a 'volition'." (*Ib.* p. 33.)

If it is implied in the intuitionists' whole notion of a cause, that it is a *substance*, some proof ought certainly to be offered that the notion is correct, and that causes which are substances really exist. But it may be said, though direct proof, that the particular kind of substance, called the soul, exists, may be wanting, still it may possibly be shown by Dr. Ward that *causes* exist, and that these must be substances; so that from that side, and indirectly, the proof of the soul's existence may be given. We have just seen that Dr. Ward refers us to the intuitionists' notion of a cause. Let us see how he expounds that notion; turning to the place at which he addresses himself to the task, in the "Causation" article of July, 1876, pp. 18-19:

"We consider on one hand, that the idea 'cause' is a simple idea, not composed of any others; and on the other hand, that it is a purely intellectual idea, not a copy of anything experienced by the senses. In the course of our articles we have already mentioned two such simple and purely intellectual ideas: *viz.*, 'necessary' and 'moral good': and to these we here add that of 'cause'. Now, of course, there is a certain difficulty in explaining an idea of this kind. Were it a copy of some sensation, we could con-

tent ourselves with referring to such sensation. Were it composed of simpler ideas, we could explain it by reciting those simpler ideas. But neither of these methods being (by hypothesis) available,—we can only suggest the occasions on which an inquirer may unmistakably recognise, what is beyond doubt a very prominent part of his mental furniture. Now the instance, most commonly given by philosophers of a 'cause,' seems to us most happily chosen for our purpose; as being one in which that idea is exhibited with especial distinctness and prominence: we refer to the influx of a man's mental volitions into his bodily acts. I am urgently in need of some article, contained in a closet of which I cannot find the key, and accordingly I break open the closet with my fist. Certainly my idea of the relation which exists between my volition and my blow, is something indefinitely beyond that of mere prevenance" [Dr. Ward's word for phenomenal sequence]. "If on the one hand that idea is incapable of being analysed, on the other hand it is to the full as incapable of being explained away or misapprehended."

Not one word about *substance* from beginning to end; not one word about that which, as we since learn, "is implied" by intuitionists "in their whole notion of a cause". Perhaps it will be replied, that in this long passage Dr. Ward is explaining the notion of cause generally, of causation, not of *a cause, i.e.*, something which has or exercises causation. This, I believe, is partially, though not altogether, the case; but even that does not mend the matter. The connexion between a substance as cause and its power or attribute of causation is left entirely blank. Dr. Ward seems to slide from one to the other without noticing it. In the above passage he begins with explaining causation, and continues doing so down to the words "mental furniture". On the other side of the full stop which follows them, he has probably a causal *substance* in his mind. But if he has, he takes no notice of the newly introduced notion; still less does he offer any explanation of how causation can possibly be connected with a causal substance. And in the first part of the passage he is doing neither more nor less than what I have elsewhere noticed that Hegel and Schopenhauer do (MIND XVI., p. 501); that is, he is assuming the notion of *efficacy* as an ultimate and unanalysed datum.

The soul, then, is not proved by Dr. Ward to exist as a causal substance, either directly or indirectly; still less is it proved to exist as an originative, intelligent, and free causal substance. The proof breaks down from the beginning, or rather no proof is really attempted at all. For it is suspended entirely on the intuitionists' doctrine of causation; and, even if that doctrine were true, would break down just the same. For the link of suspension is wanting.

It is painfully interesting to see the care with which Dr. Ward accumulates his logical apparatus for explaining and demonstrating his doctrine of causation, which is destined after all to be of so little service. Two great principles there are, he

says, which it is requisite to make good against phenomenists; one is the "principle of certitude," or as he elsewhere calls it "of intrinsic certitude," which is this: "Whatever a man's existent cognitive faculties, if rightly interrogated and interpreted, avouch as certain, is thereby known to him as certain" (July, 1876, p. 5). The other is the principle that "the human mind has a power on occasion of certainly and immediately cognising necessary ampliative truths as such"; meaning by *ampliative* what are more frequently called synthetical as opposed to merely analytical judgments. (*Ib.*, p. 7.)

The "principle of causation" or "the causation doctrine" (both phrases are Dr. Ward's) is maintained by him to be a necessary ampliative truth; and is expressed in the statement, that "whatever has a commencement has a cause" (*ib.*, p. 13). All this part of his argument, Dr. Ward frankly and fairly tells us, is based "not on grounds of experience, but of intuition". "It is only," he says, "through *intuition*, that either phenomenists or any one else can possess experience of *phenomena*. Those particular intuitions, which are called acts of *memory*, are literally the only basis they can allege, for any one experience which they cite" (*ib.*, p. 14).

Here we have the whole logical process outlined. Intuition is the basis; then the two great intuitive pillars, the principles of certitude and of necessary ampliative truths; then the particular necessary ampliative truth of causation. And what I maintain is, that, even if all this body of logic were sound and true, still Dr. Ward would not have proved his case, because the link which connects it with the soul as a substance is wanting. I leave it therefore uncontroverted; and the more readily because I have elsewhere (in the *Philosophy of Reflection*) had occasion to criticise at some length that part of Dr. Ward's theory which identifies memory with intuition, together with several of its consequences; and this doctrine really contains the root of Dr. Ward's whole system. There again we touch what must always be the real ground of any controversy, namely, concrete facts of consciousness which exist for all men, and in the analysis of which their power of mental insight is most usefully taxed. This, too, it is which gives the former part of the present argument, its psychological branch as Dr. Ward calls it, its greater interest and importance, compared to the second, which is occupied with the abstract entities of substance and cause.

And here it is worth while to remark that, in the article of July, 1876, Dr. Ward expresses the doctrine of causation in volition in a way which is very different from his detailed statement of it in April, 1879, and which, taken alone, might well be accepted by determinists. He says, p. 8: "But Free-will

includes another doctrine besides that of indeterminism; it includes the doctrine that man is a self-determining cause of volition." Now, determinists may well accept the general statement that *man* is a *self-determining* cause of volition; for, first, there is no statement about the soul being the man, or being a substance; and secondly, self-determination is at any rate determination. But this general statement is plainly not the one which Dr. Ward means to be his final one. It will stand, whatever theory we may hold about the nature of the agent concerned in volition, whether it be an immaterial substance called soul, or a particular kind of material substance, namely, some living portion of nerve organism of which consciousness is a function. In whichever way, then, we conceive the nature of the agent, determinists need not hesitate to admit that he exercises, in volition, a self-determining power. What they deny is, that he exercises, in volition, a power of choice which is *not* determined by his nature, that is, by *himself*. They maintain that the exercise, and even the existence, of such a power as that last described is not capable of being intelligibly construed in thought; that when it is said to be conceived or imagined, as it appears to be by Dr. Ward (April, 1879, pp. 33, 38), it is in a loose sense of those terms, a sense not including intelligible construing in thought; and that the notion of the soul as a substance serves no other purpose than that of veiling this want of intelligibility, by assigning an obscure source of the power which may render it acceptable to belief, without rendering it intelligible to understanding.

An agent having some *nature* or other must be conceived in or before conceiving an *act* of any kind. When we say that an act is the act *of an agent*, we mean that it is determined wholly or in part *by the nature* of the agent. What he *is* manifests itself in what, under the circumstances, he *does*. Let us then assume, for argument's sake, that the agent is a substance called soul; and let us take those acts which are called acts of choice. Then any act of choice will be determined by the nature of the soul; and that is the determinist's theory; *liberty* consisting in the determination of the choice by the nature of the agent (which on the present assumption is the soul).

For, when we conceive attractions soliciting the soul (or agent, however conceived) in opposing directions, there must necessarily be conceived also something which, being solicited, is capable of re-acting upon the solicitations; and this something we now call the soul, in that state of consciousness which it has when the solicitations begin, and which passes into other states of consciousness when they continue; which are the 'internal circumstances' spoken of by determinists, the soliciting attrac-

tions being called 'external circumstances'. The re-action of the soul upon the solicitations, so as to decide either between them, or between some of them and some of its own internal states, is what is known as choice or volition. Now all the elements of the problem are here taken account of, and therefore the determinists are justified in saying that the will is necessarily determined by the balance of motives, or circumstances external and internal. In the re-action of the soul with its 'internal circumstances' upon the external solicitations consists its freedom. If it were determined in any other way than by its own re-action upon the external solicitations it would not be free, for it would not be exerting volition.

But Dr. Ward's theory, so far as I can understand it, is that *liberty* consists in the *non*-dependence of the choice on the nature of the soul, in *non*-determination by it. And when asked—On what then does it depend? his reply, I imagine, would be—On the soul's power of choosing. I pass over the tautology of this supposed reply, its alleging the possession of a power of choice as the ground of exercising choice; and confine myself to the remark that, on this showing, the soul is only then perfectly free when its own nature is perfectly inoperative in determining its acts of choice. We are required to conceive a perfectly colourless and independent power of choice, a bare faculty of resolve, severed from the rest of the characteristics which compose the soul's nature, for only in that severance is it conceived as the ground of freedom; and yet that the soul itself, including its nature, which does not contribute to the free choice, is blamable or praiseworthy in consequence of it.

Dr. Ward then, I think, is in this dilemma: either the free choice, or resolve, of the soul is caused by the soul, and then he is a determinist; or else the free choice, or resolve, of the soul is caused by the bare power, in the soul, of freely choosing or resolving, and that is tautological trifling. I argue therefore that, unless Dr. Ward is a determinist without knowing it, the only meaning attributable to his doctrine of free-will is this:—that a free act is an act without an agent. On this point I would refer the reader to Jonathan Edwards's *Enquiry concerning Freedom of the Will*, Part II., Sect. iv., entitled, "Whether volition can arise without a cause, through the activity of the nature of the soul". Indeed, in all parts of the subject, except its connexion with physiology, which is not treated by Edwards, this classical work is an authority of the highest order.

And this leads me to make one or two remarks on Dr. Ward's belief that the existence of guilt and sin (April, 1874, pp. 15, 34-5), and the existence of morality in the Christian sense, and of a moral government of the world (April, 1879, p. 18), are

incompatible with determinism. His argument may be stated briefly, but not I hope unfairly, as follows :—Since we did not make our own nature—then, if our acts of choice are determined by our nature (as they are, in the last resort at any rate, on the determinist's theory), we should not be morally responsible for our acts of choice, unless we suppose that we have a power of choosing *independent* of our nature.

Such is the argument as I apprehend it, and stated as strongly as I can state it. I am not insensible to its great apparent cogency. But, in the first place, I think it is founded on a misconception of what moral responsibility is. Moral responsibility consists in responsibility to a tribunal of a moral character, such as we conceive our own conscience to be, and God to be. It does not consist in our being *justly* responsible for certain acts. But the question whether or not we are *justly* responsible, in the sense of justly deserving praise or blame, reward or punishment, for certain acts, is a question for the moral tribunal itself;—the *moral* character of which tribunal makes our responsibility a moral one.

Now these two ideas of moral responsibility are confused in the above argument. It is argued, virtually, that we are not *justly* responsible for acts flowing from our own nature, so far as we did not cause that nature to be what it is. And I reply, that this is a question for the moral tribunal to decide; and that we are *as a fact* morally responsible for those acts, because we are and feel ourselves to be responsible before moral tribunals—namely, God and our own conscience. If our own conscience should be blind, yet God will judge right. He will apportion justly praise or blame, Whose are, in Milton's language, "the pure eyes, and perfect witness of all-judging Jove".

The theory that we cannot conceive ourselves to be morally responsible, unless we can show, by some fine-spun argument, that we are in some cases justly punishable, is a theory impugning the competence of the moral tribunals named. Like a too eager attorney, it would have us go to law with God. The very opposite temper from this has been the mark of men not usually reckoned as deniers of moral responsibility. "Behold," says a Hebrew Psalmist, "I was shapen in wickedness, and in sin hath my mother conceived me. But lo, thou requirest truth in the inward parts." This writer at any rate felt no incompatibility between the sense of sin and the belief that his nature was not self-created.

Still it may possibly be said, that this evades and does not meet the objection, or rather that it meets it only by a counter-allegation, supported indeed by testimony, but still an allegation *of fact* only, the fact that persons are found who feel moral re-

sponsibility and moral guilt *though* feeling also that it attaches to them through no deed of their own. This case, it may be said, is an anomaly, inconsistent with the plain dictate of universal good sense, that no man is *justly* responsible for what he did not himself choose to do or to omit. It is required, then, to be shown in answer to this further objection, what the reason of the case, underlying the fact of the case, really is; and besides, that this reason of the case brings it *under* that plain dictate of universal good sense, and does not leave it standing out, as a counter fact, or difficulty in the way of our accepting the dictate. This I will now attempt to show.

In cases like that quoted from the Psalms, the thing for which the agent accepts moral responsibility is not the mere fact of having been born with such and such a nature, irrespective of what that nature is; but it is the act or acts of choice, springing from that nature, in doing which acts of choice he has had that sense of having power to choose which is called the sense of freedom. He is in fact *so born*, the nature which he is born with is such, that he has that sense of freedom in innumerable acts of choice; and the responsibility which he accepts is for his acts springing from his nature, for his acts and his nature together. It is as much part of his nature to be capable of free choice, as to have innate tendencies and affections to choose between.

Now I say, that what is meant by *freedom* is to be learnt from this *sense of freedom*, and from no other source. The sense of freedom in the agent is the subjective aspect of the objective freedom in the act of choice, is what warrants us in calling the act free, just as, when we call a rose *red* or a stone *hard*, our sensations of redness and hardness are the warrant for calling them so. We are not to look for any other freedom, any *real* freedom as it is called, of which the sense of freedom is a copy, or to which it gives a testimony. The sense of freedom *is* the real freedom. Volition, choice, resolve, are free acts by the nature of the case. The sense of freedom is an essential part of the consciousness we have of them.

Now the sense of moral responsibility is attached to, and founded on, the sense of freedom, and its reality and objectivity are warranted in the same way, namely, by being confirmed in consciousness by reflection, on repeated self-examination. We *are* morally responsible for acts of choice (and indirectly for their consequences), because *conscience*, which is reflection on such acts, has that sense of moral responsibility, and a deeper and keener sense of it the more it reflects upon them.

But this sense of freedom, which is the real freedom, together with its corollary moral responsibility, is not opposed antitheti-

cally to necessity; it is not freedom *from* the laws of the agent's nature, but it is a part of, and bound up with those very laws and that very nature. The agent is not other than his nature and its laws; nor is his nature something imposed upon him externally, as seems to be imagined by those who talk as if it were *possible* for a man to be morally responsible for the nature he is born with (in the narrow sense they give the words), as they plainly do, when they repel the notion on the ground, not of its impossibility, but of its injustice.

The agent other than his nature and its laws, and his nature something imposed on him externally—these are notions required by the fictitious freedom, falsely called *real*, falsely supposed to be the real existence of which the sense of freedom is a copy and a testimony. Required by it, because, unless the agent were pictured separable from his nature and its laws, that fictitious freedom would be an abstraction, a power without an owner. An owner for the fictitious 'double' of freedom is found in an equally fictitious 'double' of man, his substance or soul.

Returning to the sense of freedom, and to what has now been shown concerning it, I draw the conclusion that an agent is morally responsible for that part only, for so much only, of any of his acts as is accompanied by a sense of freedom, and for the consequences of that part; meaning by consequences, the habits and affections which that voluntary part of his acts has produced in him. And this conclusion brings the case under that dictate of universal good sense which we began with. But the interpretation of what part and how much of his actions an agent, on this principle, is responsible for, is a most difficult inquiry; indeed it is this that makes the chief and deepest difficulty of cases of conscience strictly so called. The sense of this, I have no doubt, partly prompted the exclamation in the Psalm quoted above. An endless labyrinth of self-examination seems to await us when we begin to dwell on these things, drawing us on into depths of thought "beyond the reaches of our souls".

As I find myself on theological ground, I will venture one more remark before quitting it. It refers to Dr. Ward's holding together, as if perfectly compatible, his doctrine of indeterminism and the doctrine of God's perfect knowledge of future human free acts. He says, "God's knowledge of future human acts supposes, as its very foundation, the will's *free* exercise in this or that direction. It is strictly and fully, we maintain, within my own power, that God shall have eternally foreseen me as acting in this way or in that" (April, 1874, p. 32). Now, that a *determinist* should hold this view is quite simple and natural; for a determinist considers that all acts, including those

which are free in the sense of being due to the agent's self-determination, are determined by the *nexus* of the whole scheme of existence, of which they are a part. That future acts should be capable of being *known* supposes, according to the determinist, that they are, by some means no matter what, determined to take place in one way *and not in another;* for otherwise knowledge of them would be impossible for want of an object.

There is a *real* and there is an *apparent* contingency; real, on the supposition that some events, or acts, are undetermined by conditions; and apparent, on the supposition that our ignorance of their conditions is what makes us regard them as undetermined. Now, *real* contingency, *real* indeterminism, and not only apparent, is what is usually meant by indeterminism; whereas determinists hold that contingency is never otherwise than apparent only. In what sense, then, does Dr. Ward hold his much talked of doctrine of indeterminism? Or rather, how is it possible for him to hold indeterminism in the *real* sense, and yet to maintain that God has perfect knowledge of future free human acts? To me the two things seem incompatible.

True it is, as Dr. Ward points out, that we conceive God's knowledge of future events as eternally present to him, and not as a mere fore-knowledge based on calculation of conditions, as human fore-knowledge is. But then this very conception is contradicted by indeterminism; for on that theory some events and acts are undetermined up to the very moment of their taking place, so that till then there is literally nothing to be known, and God's knowledge fails, not because it is a knowledge based on calculation (which it is not), but for sheer want of a knowable object. The conception of an eternally present omniscience is taken away, when existence itself is conceived as subject to a limitation which attaches only to our mode of perceiving it, namely, to our inability to experience it otherwise than piecemeal, in successive moments of time. Determinism alone is compatible with God's eternal fore-knowlege, because it alone conceives the future as knowable notwithstanding that it has not actually taken place.

The only explanation of this inconsistency which I can imagine is, that Dr. Ward has formed no *positive* conception of indeterminism at all, and has no positive theory of it, but only what he himself calls the "purely negative" one, that determinism is false (April, 1879, p, 30). Certain it is, that throughout these articles he gives us no clear or positive conception of how he imagines *real* indeterminism to be possible. *Apparent* indeterminism, on the other hand, is a determinist doctrine, and indeed an essential part of the theory. Again, then, we find Dr. Ward indistinguishable from a determinist.

Far different from Dr. Ward's is the estimate I am led to form of the nature and validity of determinism, of its function in philosophy, and even in religious philosophy. To those who are dissatisfied with the crumbling corner-stones of Scholasticism, its notions of *substance* and *substantial cause*, those Platonic fossils embedded and preserved in the Aristotelic strata,—to them the law of the perfect uniformity of the course of nature, on which determinism is based, is the one firm bridge connecting the Unseen with the Seen World. To use another image, it is the one sound logical plank in the vessel of any philosophy which includes the Unseen World in its purview. Without it, scepticism as to the existence, or at least as to the knowability, of the unseen world would inevitably break in upon us. To this it is that we owe the logical possibility of the conception, that the seen world, to which we belong, belongs itself to a vaster whole, with which it is linked in the adamantine chain of causation. Without this conception religious philosophy would be a dream. No ground on which thought of man could rest would be left for it. *Real* contingence, *real* indetermination, mean chance; and chance means scepticism, both in practice and in speculation; in practice it means life without purpose, and in speculation, thought without belief.

In the domain of practice Free-will is the link which welds together the moral action of man with the laws of the universe. The nature of man, with which he is born, is such that he not only feels various attractions, but is able consciously to incline to one and decline another. This is his power of choice, of will, of freedom. It is a part of his nature. It is rooted, with his nature, in the necessary laws of the universe, and is itself one of them. By it man is *entrusted* (in his corner of the universe) with the carrying out of God's eternal purposes, becomes an agent for making nature *in act* what from eternity it is *in potence*. In Brynhild's words to Sigurd, in Morris's noble version of the great Epic of the North, the *Volsunga Saga*, we find this interdependence admirably expressed:

> "Know thou, most mighty of men, that the Norns shall order all,
> And yet without thine helping shall no whit of their will befall."

This is possible only if conscious freedom is so welded together with unconscious action as to make one indivisible act of choice, in which the two strains of freedom and necessity are distinguishable indeed by thought, but are not separable into two acts, one bound, the other free. Necessity is the inseparable condition, or rather let us say *co-element*, of freedom. And without that co-element freedom is incapable of being construed to thought, is something as impossible as walking without ground to tread on, or flying without air to beat.

But indeterminism imagines a freedom apart from necessity, and places it in a "substance" apart, which solely because supposed to be independent of necessity is called a free agent. And see what difficulties this separatist conception gives rise to. First, the soul-substance must be admitted to have two separate modes of action, one when it acts by itself apart from the body, in which it is originative, intelligent, and free; the other when it acts jointly with the body, in which it is determined, blind, and necessary (April, 1879, pp. 37, 38). Endless questions, with no visible solutions, are suggested by this notion of duplicate action. And, secondly, the inevitable implication of freedom with necessity follows the soul-substance even into its supposed originative and free acts, its acts of resolve. A resolve is always analysable into some end or purpose compared with and desired more than others, then desired to the exclusion of others, then connected in thought with the means of realising it. It is a complex and analysable state of consciousness, and connected with other states before and after. To treat it as an act originated by the soul, a literal *creation*, and to give its origination by the soul as the only explanation of it, is therefore in contradiction to the known analysis of the act itself.

The indeterminist theory then, as given by Dr. Ward, is thus committed to maintain two distinct separations of the inseparable, the first when it separates freedom from necessity in the act of resolve, the second when it imagines a separate agent of freedom, the soul-substance. It makes freedom into an entity *per se*, and it makes the soul into an entity *per se*. The latter has no warrant in analysis, and the former flatly contradicts it. It is therefore justly characterised as *empiricism*, because it places its ultimate explanations in entities which, admitting analysis, are given out as unanalysable. And not the less empiricism, because, owing to the noumenal character of its "substance," owing to the absolute character of its "intuitions," it is empiricism of an *ontological* kind. The battle between indeterminism and its rival theory is but one division of the general conflict between empiric and analytic philosophy.

SHADWORTH H. HODGSON.

NOTE.—Since the above was written, a further article by Dr. Ward, "Supplementary Remarks on Free Will," has appeared in the *Dublin Review* for October, 1879. It is a recapitulation and enforcement of his previous positions, with more illustrations and replies to criticisms. No new position is taken up in it, nor are any new arguments employed. It seems therefore not to call for additional comment. The same remark is to be made on a still later article, "Ethics on its bearing with Theism," *Dub. Rev.*, Jan., 1880.

VI.—NOTES AND DISCUSSIONS.

THE FUNCTIONS OF THE CEREBRUM.

Professor Goltz, of Strasburg, has recently added, in *Pflüger's Archiv* XX. 1, a third memoir on this subject to his two former memoirs, noticed in Mind V. and VI. It fills 54 pages, and is equally remarkable for its positive results and for its vigorous polemic against the doctrine of strictly localised brain-functions, as variously propounded by Hitzig, Ferrier and others. In view of its exceptional importance, a somewhat extended summary of its main points is here given.

Goltz begins by urging the necessity of studying the more complex brain-processes in the light of the simpler processes of the spinal cord, and, in the case of operations on the cord, seeks especially to distinguish between the *temporary* and the *permanent* effects. While separation of the cord from the brain hardly affects the spinal reflexes in the frog, it almost destroys them at first in mammals; but thence to draw the inference that many actions which are spinal in the frog are of cerebral origin in the mammals is quite unwarranted. The cord has analogous functions in both; only, in mammals the spinal reflexes are more manifold, and, being obliterated at first, they do not reappear till the wound of the operation heals and other effects of it have passed off. The question is then how to explain their temporary disappearance, and their reappearance for good if the animal has been properly tended during the time of recovery. The connexion of brain and cord is not re-established. Neither can it seriously be maintained that there is a new formation of reflex centres in the disconnected cord. The only possible supposition then left is that the natural functions of the cord are for the time *arrested* by the stimulus from the wound of the operation, not otherwise than, as it is well-known, the regular stimulation (through afferent fibres) of one spinal centre has an inhibitory effect on other centres for the time being. At all events, one thing is clear, that sharp distinction must always be made between the temporary and the permanent deficiencies *(Ausfallserscheinungen)* resulting from any operation on the nervous system. But this is just what Hitzig, Ferrier, Carville and Duret, Soltmann, &c., have overlooked in operating on the cerebral cortex. Goltz, for his part, besides being able to confirm his former account of permanent deficiencies in all essential points, believes himself now to be far on the way to show that the analogy between the nervous functions in the lower and higher animals holds not only, as long before proved, for the spinal cord but also for the cerebrum. He has a dog which has long survived the temporary effects of extensive destruction in both halves of the cerebrum, and which behaves very much like a frog in similar circumstances. This dog, which may now be described as "an eating complex reflex machine," was subjected (always under the influence of chloroform) to an improved application of the method

of washing-away the cortical substance described in Goltz's previous memoirs. Four times within eight months in 1877, large portions were removed, first in the so-called motor-zones, then in the posterior lobes, left and right. The animal recovered perfectly, and the effects of the operations, in the form they came to assume in the course of 1878, have remained without further change (down to May, 1879), so that they may now fairly be regarded as *permanent.*

The effects are described at length (pp. 10-26), and agree in the main with the results given in the former memoirs. Touch is greatly blunted over the whole surface, but by no means extinguished. Sight, after wholly disappearing for a time, is recovered to the extent that locomotion is distinctly guided by retinal images; the dog sees no better than, but sees as well as, a frog deprived of the cerebrum. Hearing, Taste, and Smell, which seemed to Goltz unaffected in his former experiments with other dogs, are now proved to be reduced but still not wholly absent—just like sight and touch. Movements are as energetic as ever, though apt to be rendered uncertain, by reason, apparently, of the imperfect tactile sensibility. The power of localising in external space or on the surface of the body is profoundly affected. There is great voracity, and nothing is held of account except as it can be eaten. No sexual appetite. No sociability with dogs or men. No sense of property or sign of resentment when despoiled of a bone or other food. Nevertheless, the animal is subject to sudden and swiftly passing gusts of fury in particular circumstances—when lifted from the ground, when the fore-paw is long held, &c. It can, with some trouble, be induced to play. Excretions normal. Very little, but still some traces of learning by experience; the dog can find the table on which meat is kept, and, having been bitten when taking bones from other dogs, is now warned by their growls to refrain. No trace of reflective or inventive faculty; the dog remains under a chair, round the legs of which a string is tied, when other dogs escape at once by creeping under or stepping over. Like brainless frogs, it performs under stimulation a number of reflex actions (some of them very strange) with the regularity of a machine. Summing up: "This dog, under extensive destruction of the cortical substance of both hemispheres, especially the temporal and occipital lobes, is profoundly imbecile; shows a blunted sensibility and peculiar disturbance of sight, hearing, smell, and taste; the unimportant disturbance of its movements is sufficiently explained by its imbecility and blunted sense." The facts are confirmed by a number of similar cases, in which the experiments, if carried less far, were also protracted over months. Besides showing that hearing, smell, and taste are affected with the other senses, the longer and ampler experience has proved, as regards movements, that the power of using the fore-paws as hands is not, as Goltz formerly thought, permanently lost. How much in the account of permanent deficiencies, as it now may be supposed finally made up, is due to destruction of the grey or of the white substances respectively, and how much perhaps to unintentional injury of the corpora striata and optic thalami, can only be determined by further investigation.

Before passing next to apply his present results to the question of the localisation of functions in the brain, Goltz offers some remarks on the positions taken up by other theorists. In reply to Hitzig, Ferrier, and Munk, who have all urged that his method can yield no information about the functions of limited areas of the cortex, he grants that it has a bearing only on the functions of the lobes generally, but contends that this is the first thing to be settled. Till it is seen whether Sense and Will are at all bound up with particular areas of the brain-surface, it is idle to look for special centres for leg, tail, or under-jaw. When Hitzig, Ferrier, and Munk agree so little that to the parietal lobe in the dog they respectively assign muscular sense, voluntary movement and touch, it is time to raise the previous question. Against localisation, in principle, Goltz has nothing to urge; but being able to form an idea of the brain quite different from the one now current, he requires much more decided proof than any of the recent theorists have brought for their various schemes. Hitzig and Fritsch's electrical stimulation of the cortex proves nothing; the fact that over great tracts no response is forthcoming makes it doubtful whether at any point, whence response follows, it is the grey surface itself that is stimulated; if it were, it is not to be supposed, whatever be the function of those silent regions, that some motor expression would not be the result when the function is electrically heightened. Ferrier, who finds the excitable region more extensive (using stronger currents) than Hitzig, affords no criterion between the movements which he supposes to spring directly from motor-centres and those which he regards as reflex; all alike might, with Schiff, be regarded as reflex. As for the harmony supposed to exist between the results of stimulation and extirpation of the localised centres, it is quite superficial; where Ferrier sees paralysis of movement following extirpation of the fore-leg centre, Hitzig sees loss of muscular consciousness; and while it is never pretended by the localisers that similarly definite results can be got with any other motor-centre, other observers have found that the motor disturbance in the fore-leg does not always follow, or last any time, upon extirpation of the supposed centre, and equally appears when other 'centres' are destroyed. But, Goltz goes on to urge, it is upon the question of restitution of function that all the previous localisation-hypotheses most completely break down. After a few days, or at most weeks, the motor-function disturbed by destruction of a 'centre' is found to be restored, and the question is where the new 'centre' has arisen. Nobody has been able to find a new centre by electric stimulation, though this method ought to be as good for new as for original centres. Three suppositions are possible, and have all been maintained in the face of facts when not at the sacrifice of the very principle of localisation. (1) Carville and Duret with others suppose that the functions lost for a time are taken on by other parts of the cortex in the same hemisphere: this view, besides surrendering the principle, is at variance with the fact that the whole cortex of one hemisphere may be destroyed without permanent loss of function. (2) Ferrier and others suppose that the lost functions are

taken on by the corresponding parts of the other hemisphere : the mistake here (since there is no doubt that each hemisphere is connected with all the muscles and sense-organs of both sides) lies in supposing, against the evidence of facts, that only the symmetrical or corresponding parts can thus supplement each other. (3) Ferrier farther supposes, in the case where movement is restored after destruction of the 'motor-centres' in both hemispheres, that the function is taken on by the corpora striata; and in like manner Luciani and Tamburini suppose that sight, after destruction of both its cortical centres, may be restored through the optic thalami and corpora quadrigemina : but this is giving up the principle of localisation in the hemispheres altogether, and is besides a most incredible demand to make upon organs so heterogeneous in character. On the whole, Goltz cannot doubt that the day will come when all the recent fine-spun hypotheses of sharply defined cortical centres—founded mainly or chiefly on the observations of the *immediate* effects of brain-lesions—will be as completely forgotten as the phrenology of Gall.

The true way of localising brain-functions, according to Goltz, must consist in following the line chalked out by Lussana and Lemoigne before the practice of electrical stimulation began. The first thing is to settle what are the permanent effects of the destruction of large cortical areas; the permanent effects of small lesions may be then sought for afterwards.

Goltz formerly determined the effects of destruction over the whole of *one hemisphere* (except the inaccessible base) in dogs :—No marked loss of intelligence; disposition to sleep in one old dog, but neither this nor sign of being easily fatigued in another at its prime; sight and touch affected on the opposite side; probably other senses also, but hardly to be determined; not a trace of muscular deficiency, except a disposition to slip in the limbs of the opposite side, doubtless through blunted tactile sensibility; tendency to turn towards the injured side, but with no inability to move straight forward for considerable distances; energetic movements towards the sound side.

He next sought for the effects of extensive destruction in the *parietal* lobes of *both* sides :—Some loss of intelligence; power of coming at call retained, but indifferently by what name; permanent affection of vision; men and dogs recognised, but the empty hand snapt at as readily as meat; no fear at bare sight of whip, but cowering when it is shaken or cracked; obstacles avoided in walking, even when small, but not a thin string; blunted tactile sensibility; forcible but clumsy movements; no muscle paralysed.

In one dog that survived for several months destruction of the *temporal* lobes on *both* sides, hearing was affected (not destroyed, as Munk, who places the auditory centre here, would maintain), also sight and touch—in fact, similar effects as in the case of the parietal lobes.

In one dog that survived for forty days extensive destruction of the *occipital* lobes on *both* sides, sight was deeply affected, but not to blindness; moving to come at call, it failed in direction; intelligence

was considerably lessened; bluntness of touch wore off shortly before death; there was no disturbance of movements. Smell was affected in this case, and also in the two cases last noted, *e.g.*, chloroform was taken without the usual reluctance.

In the *frontal* lobes destruction seems to have less effect; with partial destruction the results are unimportant; after the largest possible destruction on *both* sides, the effects are like those in the parietal lobes.

As the result of all his experiments put together, Goltz expresses himself as follows:—

(1) After destruction to any extent of any part of the cerebral cortex, the animal, if it survives, retains the power of conscious Willing over all the muscles of its body. It is not possible, by any lesion confined to the cortex, to produce permanent paralysis of any muscle. Every piece of the cortex seems able to become the organ of Will, and seems to have independent connexions with the executive bodily members. There are no special motor centres exclusively concerned in particular voluntary movements.

(2) In like manner, it is not possible, by destruction of any part of the cortex, to cause total loss of touch in any part of the body, or total loss of any of the other senses. The animal can always be brought, by every one of the senses, to perform movements that may be regarded as signs of conscious Sensation.

(3) Intelligence is affected by any considerable destruction in *both* hemispheres. The animal becomes stupid when more than the eighth of an ounce or thereby is removed from the surface of each hemisphere, and extensive destruction is followed by utter imbecility.

(4) It is not clear whether all parts of the cortex are perfectly equivalent. So far, the experiments point to a certain difference between the occipital and parietal lobes—vision being more affected by destruction of the occipital lobes, while the skin-sensibility, with the connected power of definite movement, suffers more by destruction of the parietal; perhaps, however, in the latter case, the basal ganglia are more liable to be implicated in the experiment.

On the whole, Goltz has acquired the conviction that every division of the cortical substance of the brain participates in the functions from which we infer the presence of Feeling, Will, and Intellect; every division is independently connected with all the voluntary muscles and all the sensory nerves of the body. There is no arrangement of small circumscribed centres, motor or sensory.

Goltz then devotes a section to the special question of the "Sight-centre"; first remarking on the great discrepancy of opinion among the localisers as to its position that they are all both right and wrong—right in what they assert, wrong in what they deny—because in reality it is more extended than all their "sight-centres" put together; and then supporting his formerly expressed opinion that the defective sight following on cortical lesions consists in a dim confused vision, "as if in a fog," against Munk's view that the defect is due to obliteration of representative images, whereby the animal is reduced to seeing "like a new-born child".

In conclusion, Goltz seeks to account for the phenomena which have led the localisers to their mutually contradictory hypotheses. Just as it is universally allowed that temporary inhibitory effects follow upon operations on the cord, so he believes that *all* parts of the central nervous system may suffer temporary arrest of their functions from an operation on the cortex. The effect, so far as the cerebrum itself is concerned, is much smaller after a first operation than after later ones; but, even after a first operation on one hemisphere, it may be supposed that the rest of the hemisphere is for the time disabled, and that it is through the other hemisphere that the animal, on emerging from the influence of the chloroform, at once exhibits (as it does exhibit) full consciousness. How far the basal ganglia are involved in the phenomena, cannot be determined so long as their own functions are so little known, but it seems clear that the mesencephalon and cerebellum, and even the medulla and the cord, may for a time be thrown out of gear from the cortex. The important thing always is to distinguish between the passing and the lasting effects, in cases where the destruction is great enough to leave distinct results of the lasting sort. In cases of small destruction, or even extended destruction if confined to one hemisphere, the absence of any lasting effects that can be traced leaves no doubt, as Flourens long ago maintained, that the uninjured homogeneous parts can, to a certain degree, take on the functions of the parts destroyed; though it need not therefore be supposed that the smallest part is really superfluous. The main position of Flourens thus remains unshaken by all the experiments of Hitzig and his followers. These only show that after destruction of particular areas of the brain-cortex certain phenomena of stimulation may be manifested, which have partly the character of inhibitory processes. It may be supposed that in each case a different group of nervous tracks is affected, whence the difference of result; and this whether it be by a pathological or a physiological stimulus that the effect is produced from the particular place. So much may be granted without giving in to the fancy of circumscribed cortical centres.

EDITOR.

THE RELATION OF PUNISHMENT TO TEMPTATION.

What ought to be the relation of punishment to temptation? It would be easy to represent the Utilitarian and the Intuitionalist as being directly at issue on this question. Rather, perhaps, we should say that the issue is between those who do and those who do not accept the Preventive Theory of Punishment. The Preventive Theory, namely, that the only right end and measure of punishment is the prevention of wrong-doing, may be, and has been, accepted by moralists who do not accept the Utilitarian doctrine. But the Utilitarian can give a peculiar definiteness to the theory by substituting "the prevention of pain" for "the prevention of wrong-doing". This gives him a certain advantage, for unless it will bear some such interpretation the theory seems incomplete. When we have decided that a particular

form of wrong-doing ought to be punished, it may tell us how much punishment should be inflicted; but it cannot tell us whether or no a particular form of wrong-doing is to be punished at all, for we can scarcely maintain that the state should punish all forms of wrong-doing. The upholder of the Preventive Theory who is not a Utilitarian has to compare things heterogeneous, pain and wrong-doing; the Utilitarian has to compare pain with pain. Thus we may take the Utilitarian interpretation of the Preventive Theory as the most clearly defined and the best for the purposes of this Note, premising only that what we have to say of this interpretation should be true to a great extent of the Preventive Theory, whatever meaning be given to the phrase 'wrong-doing'.

Now, it seems a legitimate consequence of this theory, that the greater the temptation the greater should be the punishment. Against great temptation you must provide a heavy penal counterpoise. On the other hand, Common Sense requires that the greater the temptation the less should be the punishment. "If all that you want of criminal law is the prevention of crime by the direct fear of punishment, the fact that the temptation is strong is a reason why punishment should be severe. In some instances this is actually the case. . . . But in most cases the strength of the temptation operates in mitigation of punishment." (Sir J. F. Stephen, *Liberty, Equality, and Fraternity*, 1st ed., p. 151.) Here we have apparently a glaring discrepancy between Utilitarianism and Common Sense. But it is soon seen that the discrepancy is not so great as it appears at first sight. When we hear the Utilitarian doctrine, we are at first inclined to compare the killing of a burglar with the killing of an inoffensive visitor. The man who kills a burglar is greatly tempted, but should be at most very lightly punished. But here the facts which constitute the temptation are facts which greatly diminish the evils usually consequent on an act of homicide. It is hard to frame cases which shall serve for a real test of our instinctive morality, for this among other reasons, that the facts constituting the temptation are usually facts which have some effect in decreasing the pain occasioned by the offence. Still, even when this is explained the Preventive Theory remains unacceptable. Great temptation, Common Sense insists, is in itself a reason for mitigating punishment.

Some agreement may perhaps be come to if we consider what is meant when we say that one man is more tempted than another. When we say that A and B have both done wrong, but that A was more tempted that B, we apparently mean,

(1) That A's character was such that in ordinary circumstances, or in similar circumstances, he was more likely to commit the crime than was B; or

(2) That A was placed in circumstances in which the ordinary or average man would be more likely to commit the crime than he would be if placed in B's circumstances; or

(3) That both these propositions are true.

Perhaps we more often refer to a difference in circumstances than to

a difference in characters when we speak of two persons as subject to different degrees of temptation; but I think that any one of these three propositions might fairly be implied in the statement that A was more tempted than B. We shall be understood when for brevity's sake we speak of the internal and external factors of temptation.

Now, let us place ourselves in the legislator's position, and this is the point from which the subject has usually been surveyed by the Utilitarian. We will suppose, not that we are dealing with one community and two crimes, but with two communities and one crime; the case is fairer because therein we may more easily assume that temptation is the one variable. It seems to me that whether we suppose the difference between the two communities to consist in (1) the external inducements for the commission of the crime, or (2) the character of the inhabitants, we naturally determine that the punishment must be greater where the temptation is greater. In fact, when once we say that temptation consists of (1) facilities for the commission of crime, or (2) tendency to commit crime, the question seems to decide itself. There would, perhaps, be exceptions. In one country so great might be the temptation that it would be impossible to prevent the crime save by punishments which would be (in Bentham's phrase) "too expensive"; and we should have to leave it unpunished. Or, again, we might in such a case introduce a small and, for the purposes of immediate prevention, quite inadequate punishment, in the hope of thereby forming a sounder public opinion. But such cases can hardly occur save where the legislator and his subjects belong to different stages of civilisation, and the general rule seems clear and acceptable to Common Sense,—the greater the temptation the greater the punishment.

Even the exception to which we have referred raises, I think, no difference of opinion. It does seem strange to Common Sense that as temptation increases we should go on increasing punishment up to a certain point, and that beyond that point we should cease punishing altogether. But still we see the cogency of the argument, "If you are to punish at all, you must punish very severely or you will do no good," and it would, I think, be generally admitted that this argument supplies the reason why certain forms of vice go unpunished. But this leads us away from our proper topic. We are, I think, agreed on the general rule that from the legislator's point of view the greater the temptation the greater the punishment.

Next let us place ourselves in the position of a judge, and this is the point from which the subject is usually surveyed by the opponents of Utilitarianism. Here the distinction between the internal and external factors is important. That the criminal's character is one particularly prone to evil is plainly a reason for punishing him severely. If between two criminals the sole difference known to the judge is that the one has been previously convicted, the other not, there can be no doubt what effect this difference would have upon the sentences passed. Yet the habitual criminal is one who has conclusively proved that he is a much tempted man by braving repeated

punishments. But it is when the difference is in the external factor that the difficulty occurs. Here we are inclined to say decidedly, great temptation little punishment. A man steals a loaf; shall it not operate in his favour that he was starving? But we must be careful, for cases about rich men and poor men are seldom perfectly fair tests. A rich man has generally greater influence than a poor man. Unpunished wickedness in high places has a singularly bad effect on the community. Besides, it may be noted that in some cases a rich man would probably be less punished than a poor man. A petty theft committed by a poor man may argue a more mischievous disposition than the same act committed by a rich man. However, if we try to exclude all other differences save differences in temptation, our natural decision is still, the greater the temptation the less the punishment. A man has been bribed to commit a crime; if the quantum of the bribe has any effect on our sentence, what effect should it be? We say, I think, the greater the bribe the less the punishment. Not, perhaps, in all cases, for the very smallness of the bribe may show that it did not afford the only motive for the crime, and we may infer a still more dangerous motive than the desire for money, *e.g.*, malevolence or the like. And the case is hardly fair for another reason, namely, because the greatness of the bribe may lead us to believe that there are few people able to pay for the commission of the crime. But take another case. Two men have joined in a crime; the one was bribed by £10, the other by £1000. I think we do consider the most tempted to be the least punishable; and for this reason, namely, that we infer that the dearly-bought man might not have done the crime for a smaller bribe, and this being so, we hold that he is the less mischievous character of the two. We must, then, apparently, admit that from the judge's point of view the greater the (external) temptation the less should be the punishment.

But in speaking of the judge's point of view, I have assumed what in any legal system that we need consider must to a great degree be the case, namely, that the judge's sentence lays down no binding general rule for future cases. If for a moment we imagine that the judge trying a criminal case can by his sentence powerfully influence the sentences to be given in future cases, all seems changed. We might think a judge right in saying, "You, A, have been tempted by an overwhelming bribe, and this will mitigate your punishment"; but I am sure that we should think him wrong if he added, "For the future the rule of this Court will be, the greater the bribe the lighter the punishment of the person bribed." Indeed we should wish him to say just the reverse,—great bribe great punishment. And even as it is there are, I think, cases in which we should expect that a mere increase in the external facilities for crime would induce a judge to increase the severity of his sentences. Suppose a great fire burned one of our large cities and placed a large amount of property within the power of thieves, we should hope that little mercy would be shown to the first man caught stealing, and that the judge who tried him would pass a heavier sentence than is usual in cases of theft. If

a new source of temptation is opened up, an exemplary punishment must be inflicted; so that even from the judge's standpoint we cannot always say that temptation should operate in mitigation of punishment.

What, then, is the difference between the position of the legislator and the position of a judge? The object of the one is to prevent people in general from offending. The object of the other is partly to prevent people in general from offending, partly to prevent in particular the convicted criminal from offending. Now, this latter object must be of great importance in the judge's eyes. He has a person before him who has shown that he in particular requires to be prevented from crime. The judge has to weigh two considerations which tend in opposite directions:—(1) Here is a man who has been greatly tempted; if I punish severely, people in general may be restrained from yielding to great temptations by the thought that heavy punishment is given in such cases. (2) Here is a man who has been greatly tempted; it is improbable that he will again be exposed to temptation so great, and I have no reason to believe that he will yield to any less. In most cases it seems to me that the considerations of the latter kind will prevail, because the effect of a particular sentence as an example or a precedent will be very small; but in some cases, such as that above mentioned, when a new temptation has come into play and affects others besides the criminal, the case will be otherwise and the sentence heavy.

On the whole, I submit that the following conclusions are agreeable to Common Sense Morality and justified by the Preventive Theory:—

(1) In the making of general laws, other things being equal, great temptation is (whether we speak of the internal or of the external factor) a reason for heavy punishment.

(2) In passing sentence on particular criminals, other things being equal, great temptation is,

- (*a*) When we refer to character, not circumstances, a reason for heavy punishment;
- (*b*) When we refer to circumstances, not character, a reason for
  - (*α*) Light punishment, in so far as we believe that the criminal requires only light punishment to prevent him from offending again;
  - (*β*) Heavy punishment, in so far as we believe that our awarding a heavy punishment will operate in future as a counterpoise to great temptations.

I am very far from arguing that our instinctive notions about crime and punishment can always be squared with the Preventive Theory. We see plainly that Preventivists may differ widely among themselves; witness the opinions of Bentham and Paley on the Criminal Law of their own time. But I doubt whether there be really any difference of *principle* between the Preventive Theory and Common Sense as to relation between temptation and punishment; and this may, I think, be shown if we are careful (1) to choose as our tests of Common Sense cases in which the facts constituting the temptation

have small influence on the direct harm done (or pain given) by the criminal act; (2) to distinguish between what I have called the internal and external factors of temptation; (3) to distinguish between the position of a legislator and the position of a judge. With regard to this last distinction, it may seem strange that the same facts should be to one man a reason for increasing, to another a reason for decreasing punishment. But really the facts are not the same. A moralist who is deciding what ought to be done to a person who has actually done wrong has before him facts which are on the Preventive Theory of much importance, but which are unknown to the moralist who is laying down general rules for the future. It is just because these facts are of great importance that we think it well to leave the amount of punishment to be given in each case as a matter, within certain wide limits, for the judge's discretion.

F. W. Maitland.

DR. BAIN ON FREE WILL.

In April, 1874—during the course of a philosophical series with which I am still engaged in the *Dublin Review*—I came upon the question of Free Will. My direct assault was upon Mr. Stuart Mill and Dr. Bain, who are far the ablest advocates of Determinism with whom I happen to be acquainted. Dr. Bain did me the honour of replying in the Third Edition of his very instructive work on *The Emotions and the Will*. I rejoined in April and October of last year, and he has rejoined on my rejoinder in the January number of Mind.

In April last—while cordially acknowledging that Dr. Bain had treated me with most abundant courtesy—I was nevertheless obliged to complain that throughout his criticism he did not so much as once refer to that central and fundamental argument on which I avowedly based my whole case. Yet, as I added, nothing could well have been more express and emphatic than my detailed exposition of that argument. On the present occasion I must repeat the same acknowledgment and the same complaint. No one can write more handsomely of an opponent than he writes of me. He even says that "I have bestowed more attention on the controversy concerning Free Will, than any one with whom he is acquainted". Moreover, the extracts he gives from my articles are evidently chosen with the view of exhibiting my position in the most fair and equitable light. And yet by some (as it were) fatality which I am quite unable to explain, he entirely ignores from first to last the precise point on which I lay stress. I have nothing left for it then, except to content myself with stating that point once more; nor shall I hesitate often to repeat the very words I have used in the *Dublin Review*. Indeed I shall be very glad to take this course; because my present audience is entirely different from that which I addressed in the Catholic periodical just named. On the other hand it is a considerable inconvenience to me that I am confined within somewhat narrow limits. It would have been unconscionable, however, to ask the Editor for a much longer space in defence than

Dr. Bain has occupied in attack. And at last I shall not improbably have a future opportunity for supplying any defect which may be inevitable in my present Note.

I will observe preliminarily, that Dr. Bain takes up far less confident ground than I had always understood Determinists to assume. I had always understood Determinists to allege, that their doctrine is certain and impregnably established. To this I answered (as Dr. Bain now quotes me) that "no Determinist with whom I happen to be acquainted had even so much as attempted to prove this," though so many have asserted it. Dr. Bain, after citing my statement, does not profess to deny it. He merely says that great *presumption* in favour of Determinism arises from the fact that "uniformity is found to be the rule of nature" in all unambiguous cases. His "present argument," he afterwards adds, "merely requires that there should be a *possible alternative* to the supposition that the will is not subject to the law of uniformity. So long as there is no *unequivocal instance* on" my "side, such an explanation," he says, "deserves to be *listened to*."

For the opposite doctrine, however, I claim, not probability, but certainty. I maintain that there are *many* "unequivocal instances" which conclusively disprove Determinism. Dr. Bain says that "if there be exceptions to the uniformity of nature, they ought ere now to have come into view in some unmistakable cases." I reply that there are not "some" only but very many "unmistakable cases," which peremptorily establish that certain actions of the human will are signal and conspicuous "exceptions" to that "law of uniformity" which prevails generally in nature. And I proceed to place before my present readers some of the arguments which I have elsewhere adduced in behalf of this conclusion.

Dr. Bain protests against the term "Free Will"; and "sees no chance of a reconciliation of the opposing views, until this term is abandoned." He ought then to look with more favour on my own controversial standpoint than on that of some other opponents; because—though I certainly cannot abandon the term "Free Will"—still I have gone through the more essential and fundamental part of my reasoning, before I arrive at that term. I begin by merely maintaining a doctrine called by me "Indeterminism"; which is neither more nor less than the negative doctrine, that the doctrine of Determinism is untrue.

Now what is the doctrine of Determinism? Dr. Bain quotes with entire assent my own virtual exposition thereof. According to Deterministsit holds quite universally that, "given certain physical and corporeal antecedents, one definite group of physical consequents infallibly and inevitably ensue". This is what Indeterminists deny, as regards certain movements of the human will. In order, however, more conveniently to discuss the question, let me take a particular case. Let me suppose that at some given moment two mutually different courses of action are open to you, and that you have to choose between them. Let me further put aside the more common case, that there is a *complication* of motives soliciting you on one side or on

both. Let me suppose that there is one strong motive attracting you in one direction and another in the other, while all other motives on either side are so comparatively weak that they may be left out of account.[1] I will first confine myself to such a particular case as this; because all controversialists will admit, that it is especially fitted for bringing the question to a definite issue.

Such a case then being supposed, Dr. Bain considers it to be experientially known which of these two motives is "the stronger," by the very fact that it carries the day. "Two powers are in conflict, and the result shows their relative force." The successful motive "exercises control, not by freedom of the will, but by the psychological power of the stronger". If antecedents were to recur in every respect precisely similar, the result would infallibly and inevitably be the same. According to Determinists, that motive which under present circumstances is the stronger, under precisely similar circumstances would again be the stronger. Moreover, according to Determinists, the stronger motive infallibly and inevitably prevails over the weaker. I am confident that all Determinists will endorse this statement of their thesis as undeniably fair and accurate. And it is against their thesis as so stated, that my reasoning has been directed.

Now many Libertarians deny that there is any intelligible sense in the affirmation, that one motive is "stronger" than another. For my own part, however, I submit that there may be a most intelligible meaning in the affirmation; and that the term, if so understood, is a very serviceable one. So far I am in agreement with Dr. Bain. I differ from him, however, in the sense which I give to this term. When he says that at this moment motive A is "stronger" with you than motive B,—he merely means that as a matter of fact you give preference in action to the former over the latter. But when on my side I say that motive A is "stronger" at this moment with you than motive B,—I mean that the *spontaneous impulse*—the direct *tendency*—of your will at this moment is towards acting on the former in preference to the latter. According to my terminology, then, it is not the will's *action*, but its *spontaneous impulse*, which evinces the relative "strength" of motives. And then, as an Indeterminist, I proceed to maintain a second proposition—*viz.*, that by no means unfrequently you *act* in *opposition* to your spontaneous impulse, to your strongest motive. The first of my two propositions, it will be seen, is purely verbal; but the second is most substantial. And I will proceed at once to adduce various correlated practical instances to illustrate both these propositions. I will follow Dr. Bain's precedent, and take my examples from the sports of the field.

[1] In my articles I have distinguished between two different ideas which are commonly expressed by this word "motive". And I think indeed that this distinction is of much importance in the *exposition* of what I account sound doctrine. But in arguing with an opponent, it may be more convenient to waive this distinction. Here, therefore, I will use the word "motive" to express any thought which in any way prompts the will to act in any given direction.

A long frost has at last broken up, and you are looking forward with keenest hope to your day's hunting. Your post, however, comes in early; and you receive a letter just as you have donned your red coat and are sitting down to breakfast. This letter announces that you must set off on this very morning for London, if you are to be present at some occasion on which your presence will be vitally important, for an end which you account of extreme public moment. Let me consider the different ways in which your conduct may imaginably be affected, and the light thus thrown on the relative strength of your motives.

Perhaps (1) the public end, for which your presence is so urgently needed, happens to be one in which you are so keenly interested, which so intimately affects your feelings, that your balance of emotion is intensely in favour of your going. This motive, then, is indefinitely "stronger" than its antagonist. You at once order your carriage, as the railway station is some four miles off; and you are delighted to start as soon as your carriage comes round. Perhaps (2) the balance of your *emotion* on the contrary is quite decidedly in favour of the day's hunting: because the public end—though intellectually you appreciate its exceptional importance—is not one with which your character leads you *emotionally* to sympathise. Nevertheless, through a long course of public-spirited action, and through "stored up memories of the past"—you have acquired the *habit* of postponing pleasure to the call of duty. Here, therefore, just as in the former case, there is not a moment's vacillation or hesitation: your spontaneous impulse is quite urgently in favour of going. Your balance of *emotion*, I repeat, is in favour of staying in the country to hunt. But good habit by its intrinsic strength spontaneously prevails over emotion; and (taking your nature and circumstances as a whole) the motive which prompts you to go is indefinitely stronger than that which prompts you to stay. Or (3) perhaps, when you have read the letter, your will is brought into a state of vacillation and vibration. Your emotional impulse is one moment in one direction, and the next moment in another. Then—as you possess no firm *habit* of public spirit—you take a long time in making up your mind. As Dr. Bain would say—and as I equally should say—the strength of your motives is very evenly balanced, whichever may happen finally to show itself stably the stronger. Lastly (4) you have perhaps very little public spirit, and are passionately fond of hunting. So you at once toss your letter into the fire: and do not even entertain the question whether you shall offer up your day's sport as a sacrifice to your country's welfare. In this case of course the motive which prompts you to stay is indefinitely stronger than that which prompts you to go.

Now all these four alternatives are contemplated by the Determinist, and square most easily with his theory. In each case your conduct is determined by your strongest present motive. But there is a fifth case which he does not—and consistently with his theory cannot—admit to be a possible one; but in regard to which I confidently main-

tain, by appeal to experience, that it is abundantly possible, and by no means indeed unfrequent. It is most possible, I say, that you put forth on the occasion what I have called in my articles "anti-impulsive effort"; that you act resolutely and consistently in *opposition* to your spontaneous impulse; in opposition to that which at the moment is your strongest motive. Thus—On one side the spontaneous impulse of your will is quite decidedly in favour of staying to hunt; and the motive therefore which prompts you to do so is quite decidedly stronger at the moment, than that which would draw you to London. On the other hand your reason recognises clearly how very important is the public interest at issue, and how plainly duty calls you in the latter direction. You clench your teeth, therefore, and resolutely set yourself to *resist* the spontaneous impulse of your will. You resolutely doff your hunting dress; you resolutely order your carriage which shall take you to the station; you resolutely enter it when it comes round. And now let me follow your course during the four miles' transit which ensues. During the greater part—perhaps during the whole—of this transit, there proceeds what I have called in my articles "a compound phenomenon"; or, in other words, there co-exist in your mind two mutually distinct phenomena. First phenomenon. Your will's preponderating spontaneous impulse is stably set in one given direction. You remember that even now it is by no means too late to be present at the meet; you are restless and ill at ease; you are most urgently solicited by inclination to order your coachman home again. So urgent, indeed, is this solicitation—so much stronger is the motive which prompts you to return than that which prompts you to continue your course—that, unless you exercised unintermitting self-resistance, self-government, self-control, you would quite infallibly give the coachman such an order. Here is the first phenomenon to which I call attention: your will's spontaneous impulse towards returning. A second, no less distinctly pronounced and strongly marked, phenomenon is that unintermitting self-resistance, self-government, self-control, of which I have been speaking. On one side is that phenomenon, which I call your will's predominant spontaneous *impulse* or *desire;* on the other side that which I call your firm and sustained antagonistic *resolve*. On one side is the strongest motive, the spontaneous impulse, the predominant desire; on the other side is that which I call anti-impulsive effort and effectual resolve.

Here, then, I come to the point of my argument. How has this spontaneous impulse or desire been generated? Dr. Bain must surely answer this question as I do. He must say that your spontaneous impulse of the moment is the inevitable and infallible outcome of your circumstances (external and internal) as they *exist* at this moment. What other account of its genesis could possibly be given? We may know then quite certainly what is the resultant at this moment of the motives which solicit your will, by knowing what is the *spontaneous impulse* of your will at this moment. Yet in such a case as I have supposed, it is a plain matter of fact, that you are *not* acting in accordance with your spontaneous impulse. Or (in other words) it is a plain

matter of fact, that you are *not* doing that to which your circumstances of the moment dispose you. But Determinists say that you must *always* infallibly and inevitably do that to which your circumstances of the moment dispose you. Therefore Determinists are fundamentally mistaken.

It is this "compound phenomenon," as I have called it—the like of which are surely very far from unfrequent—on which I have throughout mainly rested my argument. And I have now described it almost in the very words used by me last October. Dr. Bain says that the phenomenon which I describe "is no new phenomenon in human experience," and so far of course I am zealously at one with him. But he adds that this phenomenon "is spoken of in every account of the constitution of the mind". Now Dr. Bain has himself written a most able "account of the constitution of the mind". I have read with great attention, and (I hope) with great instruction, that portion of his labours which treats "the Emotions and the Will". But I protest that I cannot find in any part of that volume any recognition whatever of such facts as that on which I have been laying stress. It would interest me extremely if he, or some one of his many sympathisers, would refer me to the page—say in the Third Edition—where I shall find such facts (1) recognised, and (2) explained in some way different from mine.

At this stage of my argument, I proceed from the general doctrine of Indeterminism to the special doctrine of Free Will. Once more I beg my readers' attention to those two phenomena on which I lay stress. I draw attention to them as they co-exist, *e.g.*, in the country gentleman, who has left his day's hunting very much against the grain, from a motive of public duty, and who is in his carriage *en route* to the station. On one side is his greatly preponderating spontaneous impulse towards returning; on the other is anti-impulsive effort, successfully *contending* against that impulse. If we examine these two phenomena successively with due care, we shall see that they differ from each other in character not less than fundamentally. In experiencing the former of them, his will has been entirely passive: in eliciting the latter, it is intensely active. He is not only conscious (I say) that he *elicits* this act of resistance: he is no one whit less directly conscious, that he elicits it *by his own active exertion.* No doubt motives differ from each other indefinitely as regards their relative "strength"; that is, as regards the influence which they respectively exercise on the will's spontaneous impulse or passive tendency. Still the agent is not *left at their mercy*, if I may so express myself. His will possesses intrinsic strength of its own, whereby on occasion it can choose to act on a motive which is for the moment weaker, rather than on one which is for the moment stronger. This fact, I say, is impressed most unmistakably on his knowledge, by such an experience as I have described. His soul—such is the fact which he recognises—has on certain occasions the power of *redressing the balance* of motives, by throwing its own self-originated force[1] into this or that scale. And this is precisely an exercise of Free Will.

[1] Let no Theist misunderstand this term "self-originated" force. I ex-

Hitherto I have so spoken as to embrace those instances only, in which (1) no more than two alternatives are presented; and in which (2) only one motive for either alternative needs to be considered. But I can easily express my argument in a much more general form. I can so express it as to include those far more frequent cases, in which (1) there are various courses of action from which a choice may be made; and in which (2) multifarious motives are at work, soliciting the agent in several different directions. Far oftener than not, he can know with absolute certainty what is the exact *resultant* of these various motives; what is the exact direction in which their combined influence solicits him. He can know this at once, I say, with certainty; because he can recognise quite unmistakably what at the moment is his will's spontaneous impulse or desire—its passive tendency. This spontaneous impulse or passive tendency measures of course with infallible accuracy the preponderating influence exercised over his mind, by that complex of motives which for the moment is combinedly at work. But he knows also by actual experience, that on certain occasions he puts forth a vigorous self-originated effort, whereby he compels himself to act in some way entirely *different* from that prompted by his will's spontaneous impulse and passive tendency. On such occasions then he knows by experience that he compels himself, by a self-originated and vigorous effort, to act in some way entirely different from that, towards which his balance of motives at the moment prompts him. But Determinists will be the first to admit, that such self-originated resistance to the balance of motives—if it existed—would be an exercise of Free Will.

I am greatly disappointed that my limits do not permit me to continue further the exposition of my argument, as it is contained in the *Dublin Review*. In particular, I should have wished to illustrate in some detail the broad phenomenal contrast which exists between two classes of acts, which I have called respectively acts of "anti-impulsive" and "congenial" efforts. By "effort" I meant "resistance to desire". By "congenial effort" I mean "resistance to some (at the moment) weaker desire or weaker motive; in order to the gratification of some (at the moment) stronger desire or stronger motive". By "anti-impulsive" effort I mean "resistance offered by self-originated exertion of the will to what (at the moment) is the agent's strongest desire or motive". Now, Determinists hold that a weaker desire indeed will be overcome by a stronger; but they add that the strongest present *desire* cannot possibly be overcome by the will's self-originated *resolve*. They must maintain therefore, of course, that no such acts are possible as those of "anti-impulsive" effort. They maintain that all effort of the will is really what I call "congenial," and consists merely in crushing a weaker desire under influence of a stronger. I have argued in the *Dublin Review* that this affirmation is in direct contradiction to manifest mental facts; that what I call "anti-impulsive efforts" present the

plained clearly last April the sense in which a Theist may most consistently use it.

broadest possible phenomenal contrast to those efforts which I call "congenial". But I could not do any kind of justice to this argument, unless I exhibited various individual illustrations of my statement. And for this I have here no room.

As I have already implied, Dr. Bain really offers no reply whatever to the argument I have now set forth. He does not even exhibit it, much less reply to it. The nearest approach I can find to any recognition of it, is his reference to "stored up memories of the past" as influencing human action. No doubt they do so most importantly. But in what manner do they influence it? Dr. Bain himself must reply, by modifying the will's *spontaneous impulse;* by effecting that such impulse shall be in this direction rather than in that. Yet if this be so, how can these "stored up memories" tend ever so remotely to account for a man *resisting* his spontaneous impulse? I am here but repeating what has been said by an able and most kind critic in the *Spectator* of Jan. 10th. But I must add that the fact of Dr. Bain suggesting such an answer is the best of all possible proofs, how little he has given his mind to the point of my argument.

What he has really done is—not to answer my *reasoning* at all—but to allege various objections against the *conclusion* to which my argument points. These I will now briefly consider.

1. He complains "that he cannot grasp clearly what Free Will means". Well—I answered this question at some little length last April, and Dr. Bain has not yet explained which of my statements are to him unintelligible. Here, however, I may briefly give an answer which I think is substantially accurate, founded on my preceding remarks in this Note. If an agent at any given moment has a real power of successfully resisting his will's spontaneous impulse and passive tendency,—at such moment his will is free. If he exercises the said power, he exercises Free Will. Nay, if he *refuses* to exercise it—nevertheless his will may at the moment be free; because he *can* exercise this power if he chooses, and he has full power (within certain limits) so to choose.

2. Dr. Bain "would like to have the region of failure of uniformity closely circumscribed". In other words (as I understand him) he wishes to know how often in the day, on what occasions, under what conditions, I maintain that a man's will is free. I briefly entered on this subject at the end of my article of last April, and expressed a hope of treating it fully hereafter. I fancy that Libertarians would considerably differ from each other in their answer to this question; which, however, has really no bearing on the essential point at issue between Theists and Antitheists. My own humble view is, that a man's will is free during pretty nearly the whole of his waking life.

3. Dr. Bain implies a wish to understand how such a science as psychology can possibly exist, if so many psychical phenomena are external to the sphere of uniform phenomenal sequence. I admit heartily that this is an inquiry which Libertarians are bound expressly and intelligibly to confront. For my own part I did confront it, in an article on "Science, Prayer, Free Will, and Miracles," published by me

in the *Dublin Review* as far back as 1867. I shall have great pleasure in forwarding Dr. Bain a copy of that article. At the same time it may be as well here to point out one obvious fact. The "spontaneous impulse" or "passive tendency" of any given man's will, at any given moment, is a matter open to scientific calculation in the strictest sense. This particular phenomenon at all events is infallibly and inevitably determined by phenomenal antecedents. In fact (as I said last October) I think that psychologians have been unduly remiss in not labouring more actively towards the exploration of this phenomenon. Consider —as one instance out of many—the mutual relations of emotion and habit. Under what circumstances does emotion spontaneously prevail over habit? Conversely, under what circumstances does habit spontaneously prevail over emotion? How very little has yet been done (so far as I happen to be aware) towards elucidating this question!

4. Dr. Bain especially desires to know, how Libertarians stand with regard to the doctrine of *causation*. He asks, *e.g.*, whether, according to Libertarians, "from the occurrence of a given antecedent, we can conclude what the consequent will be". Surely he must be well aware, that every Libertarian answers this question emphatically in the negative. In any given instance of free action, the elicited act of will is not infallibly determined by its phenomenal antecedents, but on the contrary is elicited by the agent according to his own unfettered choice. This is just what we *mean* when we say that the action is free.

"Can there then be such a phenomenon"—Determinists ask—"as a *causeless* volition?" In my article of last April I treated this matter in detail. The difficulty raised I understand to be this, though I am expressing it in my own words. "It is a truth accepted by the common sense of mankind, that every event has a cause. In fact this is the very truth which we call the 'doctrine of causation'. But by a 'cause' is meant a phenomenal antecedent, from which the 'effect' ensues in the way of uniform phenomenal sequence. Now there are certain acts of the will, in regard to which Libertarians deny that such acts do proceed from phenomenal antecedents in the way of uniform phenomenal sequence. Therefore Libertarians deny that 'doctrine of causation,' which is accepted by the common sense of mankind."

It has always amazed me that Determinists can see any force in this objection. I am the last to deny that many of their arguments are extremely plausible, and demand most careful consideration. But this particular argument has its origin in a perfectly marvellous confusion of thought. Intuitionists entirely deny—as is surely quite notorious —that the word 'cause' has (in the accepted doctrine of causation) the sense which a Determinist supposes. They entirely deny that the common sense of mankind accepts the 'doctrine of causation' in the sense in which a Determinist understands it. They entirely deny that in that sense the doctrine is true. They confidently affirm that in that sense the doctrine is false. Yet even so unusually able and thoughtful a writer as Mr. Leslie Stephen, has fallen a victim to the fallacy of which I am speaking. He represents Libertarian Theists as holding that "we are bound by a necessary law of thought to believe in uni-

versal causation"; and so far he represents them truly. But he proceeds to represent them as "saying that another necessary law of thought tells us that causation is not universal," because that man's will is free.[1] On the contrary, Libertarians are removed in the furthest possible degree from admitting that a free human act involves a "causeless volition". They say that such an act exemplifies the doctrine of causation more expressly, more emphatically, more clamourously, than does any other phenomenon in the world. All this I set forth to the best of my power last April; and Dr. Bain—according to his wont—has referred to my argument without attempting to answer it.

5. At last, I think that Dr. Bain lays his chief stress on the fact, that all *other* phenomena proceed by uniformity of sequence. He regards it as in the very highest degree improbable that one particular class of phenomena—*viz.*, human volitions—should be an exception to this otherwise universal rule. But he makes no way whatever in controversy, by merely pointing out that according to *his own* theory of life, such exceptionality is most improbable: he has to show (if he can) that it is improbable according to *his opponent's* theory of life. Now, according to his opponent's theory of life, such an exceptionality is not only not an improbability, it is an absolute necessity. There can be no such thing as Theistic morality without Free Will. On the other hand, if you *deny* Theistic morality—then (I quite admit) Free Will would be an uncouth, unmeaning, portentous exception to the otherwise universal course of nature. In fact, I may turn the tables on Dr. Bain. Unless Theistic morality be sound doctrine, Free Will is a portentous and unintelligible anomaly. But (as I trust I have shown) Free Will indubitably exists. Dr. Bain, therefore, either must admit that there exists what he himself would describe as a portentous and unintelligible anomaly, or else he must admit that Theistic morality is sound doctrine.

W. G. Ward.

VII.—CRITICAL NOTICES.

An Inquiry into the Process of Human Experience: attempting to set forth its lower Laws, with some hints as to the higher Phenomena of Consciousness. By William Cyples. London: Strahan & Co., 1880. Pp. 806.

As the title suggests, this voluminous work aims at supplying a complete scheme of philosophical doctrine. Beginning with an account of the facts of empirical psychology as studied and observed in the light of recent physiological research, the writer gradually advances to the discussion of the questions of the ultimate nature of Consciousness, the existence of a soul or spiritual entity, the relation of the phenomena of the higher moral consciousness to religious doctrine, together with the more practical problems of philosophy such as the

[1] *Fortnightly Review*, June 1876, p. 818, "An Agnostic's Apology".

ends of conduct, the nature and uses of evil, and the function and laws of art. Throughout the author shows a striking degree of originality both in conception and in mode of presentment. Mr. Cyples has evidently read much, but he has pondered far more. Thus though he again and again acknowledges his obligations to English thinkers, more especially Professor Bain, Mr. Herbert Spencer, and Mr. G. H. Lewes, the reader will look in vain for any simple reproduction of their ideas.

Originality is bound before all other things to be clear; for new thought as such makes a greater demand on the attention, and cannot be assimilated unless it be presented in a simple well-defined form. I regret to say that the work of Mr. Cyples fails to comply with this requirement. To begin with, although there is a certain method in the exposition, this might be indefinitely improved. At every few pages the author half opens up a new phase of his subject only to tell us that he is not sufficiently advanced to deal with it. There is an amount of backward as well as forward reference which is rather wearisome. In one place a whole set of principles is repeated word for word in the shape of foot-notes.

These facts sufficiently indicate defects in the orderly arrangement of material. But these are trivial when compared with the fundamental fault of indistinctness or inarticulateness from which the author hardly ever escapes. There is a want of definiteness of thought and precision of statement on almost every page. This is partly due to a literary style which is something quite wonderful in its way. Although hitherto philosophy has been commonly regarded as a branch of literature, it is of course open to any one to say that there are advantages in adopting a purely technical phraseology in philosophic writing. But in that case it would seem to be necessary to give a preliminary definition of the symbols to be used. Mr. Cyples appears to delight in piling up new and compound technicalities; but unfortunately the reader looks in vain for clear definitions. What is generally offered in the way of definition is worse than the term itself, as when, on p. 10, organisation is defined as "the interhappening of structural statics with related dynamical activities". The title of the book is typical in its vagueness; and nowhere is there an attempt to define the much-disputed term, Experience. As samples of awkward unintelligibilities in expression I may take the following: "to be actualised egoistically," "these reckonable positionalised individuations," "non-metaphoricalised sensation". But to give the reader any conception of the author's manner it would be necessary to quote some of the many huge shapeless sentences, which bristle with verbal asperities of this kind. A good deal of this must be set down to excessive individuality. The writer seems to shun everything familiar and customary in phraseology. 'Motion' is too poor a thing for him so long as it wears this ordinary verbal dress, so he glorifies it by terming it "executive operation". He never speaks of anything so commonplace as a state of consciousness or a mental process; we hear instead of "self-actualisation" or "egoistic awareness". The

words 'mode,' 'form,' 'variety,' are studiously avoided in favour of "style": thus we read of "a style of sentiency," "the style of material causation," and so on. These innovations in phraseology have not even the justification of being picturesque.

Faults of writing are often connected with faults of thinking: and the volume before us seems to illustrate the observation. I have patiently tried to read Mr. Cyples on the assumption that to himself every term and group of terms conveys a precisely defined meaning, but I have failed. In some cases I can get at no meaning at all after repeated readings of a passage: in many more I can only feel sure that I have got an adumbration of an intelligible proposition. Under these circumstances the critic can hardly help concluding that the author does not think clearly, however presumptuous this affirmation may appear to the latter.

Mr. Cyples may think that I am very hard on a few minor failings. A moment's reflection will however tell him that a reader of his ponderous volume would not have felt these faults so keenly if he had not found something to make him persevere with the perusal. It is because there is so much that is new, striking, and stimulative of thought in the book that the critic so keenly regrets its shortcomings. He cannot but feel that in this busy age when it is a difficult business to get people to read philosophy at all, there is little chance of new ideas arousing the attention they deserve if they are not presented in a more attractive shape than that hit upon by Mr. Cyples.

Our author's special aim seems to be to re-examine the results of modern psychological research for the purpose of determining whether the science offers any support to, or allows any opening for, the aspirations and beliefs of the religious mind. In one way it may be called the complement to the well-known recent work of two English physicists. Modern psychology seems to our author to treat these higher phenomena of consciousness with too scant courtesy, and he sets himself to inquire what a thorough-going physiology of mind has to say to the affirmations of the higher moral consciousness as they are to be met with in the confessions of religious men. Here lie at once the interest and the danger of the task Mr. Cyples has undertaken: the interest because the problems opened up are of vital consequence to everybody; the danger because it is so enormously difficult to adhere to a rigorously scientific procedure when the motive is no longer a general interest in truth as such, but a special and supreme interest in a particular group of questions having this unique practical significance. Let us see how the author has accomplished his difficult task.

The volume opens with a general sketch of the physical conditions of consciousness both within and without the organism. While leaning here largely on the well-ascertained results of modern research, Mr. Cyples goes at places considerably in advance of the present stage of incontestable knowledge. Thus by following out and rendering more definite the idea of Mr. G. H. Lewes, that every state of consciousness is compounded of sensory and motor factors, and involves a central grouping of elements, he ingeniously formulates a "Law of

Consciousness" or "Law of Effectiveness," which says that for a conscious sensation there is necessary a "coincidence of movement in the fibres of at least two senses". The second sense is always found in a related motor activity or, as the author chooses to call it, "locomotory-activity" which is "physiologically provided for in respect of each sense-organ". The facts brought forward to prove that there is this combination of activities in every case are interesting, though perhaps hardly sufficient. The writer argues skilfully in the following passage :—

"The allotment of the special sense-organs in the bodily frame—in particular the spreading of the apparatus of touch over nearly the whole external superficies, with the partial extension of it internally, in the mouth, &c.—makes it impracticable for the muscular apparatus (except when acting below the *minimum* fixed by the Law of Effectiveness) to act isolatedly. There are few movements which do not, by contraction of the skin at some point, bring the sense of touch into play. In the very act, too, the muscular operation appeals to the sense of temperature; which, again by causing, or, as we may better say, working contraction and expansion of substance, implicates the muscular sense" (p. 32).

After this general review of conscious operations Mr. Cyples takes up the difficult problem of Pleasure and Pain. The definition of pleasure (pp. 48, 49) is too long to quote. It takes as the basis of pleasurable sensation a specific grouping of nervous activities in a sense corresponding to a definite mode of sensation, as a distinct colour, sound, &c. In other words, pleasure is the result of a uniform mode of stimulation in any sense provided it comes up in intensity and extent to the requirements of the Law of Effectiveness. Such a uniform action is said "to fulfil and cumulate reminiscence". Pain on the other hand has no positive physical conditions : it arises "whenever an established nervous co-ordination—in other words a natural or habitual grouping of fibrils—is in act disintegrated, being reduced within its customary area to a lower numerical activity" (p. 55). It is "a protest which consciousness makes against its own dwindling"; and pain lasts until the co-ordination is either throughout its extent destroyed, or restored, or finally broken up into parts that fall below the limits of the Law of Effectiveness. Painful experience is thus the reversal of pleasurable : it is a disintegration corresponding to a previous integration, "summing up all the reminiscences historically belonging to the nervous co-ordinations interfered with by the injury". The author does not shrink from a rigorous logical carrying out of this reasoning, contending that the pains of pricks, wounds, &c., no more than neutralise the past pleasures obtained through the structures injured, in which, however, must be included not only "the ecstatic thrills bubbling out in the crowings, the triumphant tossings of the baby in the nurse's arms" but the "antique joys" of embryonic life. Mr. Cyples seeks to get over the difficulties in the way of this hypothesis by help of a law of decrease of nervous ratios, by which he appears to mean the effect of habit, though the meaning is not as clear as might be. He clearly sees the "irrationality" of pain in many

instances, that is, the want of a discoverable relation between the degree of pain and the importance of the organ, and infers from this that unless there is blind failure or malignancy in things there has been a catastrophe at some prior stage of the history of man "jarring the happenings of the human experience".

I have given the author's doctrine of pleasure and pain at some length because it is a very good sample of his philosophical "style," if I may adopt his own expression. The student of modern psychology will after a little reflection recognise how very closely it approximates to well-known current views. The bringing out of the element of equality or smoothness in pleasurable stimulation is, I think, important, though this point might easily have been much more precise by help of a reference to Fechner's views. Whether Mr. Cyples is right in resting the pleasurable effects of uniform stimulation on its being so favourable to the satisfaction of expectation, and so to the incorporation of reminiscence into sensation (which is all the meaning I can extract from the phrase "fulfil and cumulate reminiscence") may be doubted. The phenomena of musical discord as elucidated by Helmholtz seem to point to the conclusion that smoothness of action is specially favourable to continued efficiency of structure, whereas abrupt and jerky action is unfavourable. The doctrine of pain, which on the surface curiously resembles that put forward by the late Léon Dumont in his *Théorie scientifique de la Sensibilité*, seems to me a little far-fetched. If all pain involves injury or something approaching to this, why not make this positive fact the basis of the feeling without resorting to the idea that it arises through the mere absence of what is destroyed, and, as it seems, through a consciousness of this loss? Mr. Cyples distinctly tells us that "the fact of the nervous grouping being less than on a prior occasion is somehow recognised" (p. 82). It is plain indeed that our author here wants to make a new mystery of pain. The interesting side of pain to him is that it appears to be a "style" of consciousness "somehow in excess of the lessened physical activity then in use".

What thus appears in the lowest stage of sentiency appears according to our author more plainly as we rise into the complex modes of consciousness. In discussing the intellectual processes of memory, comparison, self-consciousness, &c., to which he now passes he seeks to bring out the fact of a growing detachment of consciousness from direct physical causation as commonly understood. Thus in all comparison of a present with a past impression the Ego shows "a capability of complicating its own phenomena". Self-recognition again, or "self-awareness" is viewed as something altogether apart from physiological conditions, as a process essentially inscrutable and mystical. In the still higher regions of Emotion and Will the spontaneous activity of the Ego comes yet more clearly into view. Mr. Cyples is too scientific to hastily adopt the testimony of consciousness to free-will in view of the great generalisations of modern physical science. So he professes to inquire into the evidences of such a power of self-determination. He finds these revealed most clearly in the

phenomena of the higher moral consciousness, such as aspiration or the internal determination of thought towards good, the overcoming of temptation, and so on. Modestly rejecting the idea that volition can directly affect external movement—though he raises the question whether the common assurance of possessing this power does not point back to the loss of some higher endowment in the infancy of the race—he contends that these moral and spiritual activities may involve the creation of an increment of nervous energy in the higher centres which infinitesimal addition of physical energy may for ever escape the finest standards of measurement of the physicist. All that is needed he says is some further "elaboration of cerebral structure," which might, he modestly hints, be brought about by the addition of "a single vibration affecting only the centre of the diagram in a single brain-cell". After this one is not surprised to find the author proceeding with a like semblance of scientific caution to weigh the possibilities of such an increment of energy becoming the germ of an "interior finer organisation," the activities of which make up the life of the Soul, and of this organisation being acted upon by a direct communication from the Divine Source, and serving as a vehicle for the Soul when it must part company with the grosser organisation of the vile body. Notwithstanding the repeated assurances of the author that his purpose is not to discuss the truth of religious dogma, he here plunges pretty deeply into the mysteries of the Christian faith. And, as might reasonably be expected, the deeper he goes the more vague he becomes. The looseness of his thought appears to me to reach its climax on page 376 where he gives us "a first rough definition" of the Soul after this fashion: "It is the interior, higher, egoistically-obtained organisation of actualising-apparatus always modifiable by the moral conduct of the Ego, but representing potentially its total of reminiscence available for the conditioning and defining of personality," and so on through a sentence covering the greater part of a page, which might perhaps be best described in the author's own language, as a masterly instance of "a cumulation of (verbal) reminiscence".

No psychologist can possibly object to the examination of any class of mental phenomena with a view to see whether they can be accounted for by known causes, and there still remains to be done a good deal of nice work in analysing those more subtle and intricate phenomena of moral and religious aspiration to which Mr. Cyples here calls our attention. Only the examination must be rigorously scientific, and unknown causes must not be called in till it is completely demonstrated that known ones fail to account for the phenomena. Mr. Cyples hardly makes any pretence at this truly scientific method of exhaustion. He is satisfied at finding, as he thinks, fugitive traces and "hints" of a spiritual activity that transcends the effects of physical causation. But the only certain facts that he here lights on avail him but little. It is only the most crass materialist who would say that the "style" of mental life is discoverable in physical events. The fundamental functions of mind, as consciousness of a past or memory, sense of agreement, &c., are *sui generis*, having nothing

analogous in the operations of the physical world. All that a thoroughgoing and consistent physiological psychology asserts is that to every mental event there corresponds a physical, and that the former varies in certain respects as the latter varies. This is the proposition that Mr. Cyples must upset before he can claim the least scientific character for his new mysticism; and the example of other living quasi-scientific mystics, more especially E. von Hartmann, may perhaps tell him whether this is an easy task.

There is no time to follow Mr. Cyples into his metaphysical proof of the existence of a substance mind in addition to the material substance to which he thinks all scientific men really hold, whether they know it or not. There are some curious speculations here on the attitude of modern science to religious belief, and a confident prediction that the scientific world will be compelled by the laws of the human mind itself to restore the idea of quasi-personality to nature as soon as the complexity of its operations is better apprehended. But the reader has possibly had enough of bold speculations and would rather hear of the less ambitious parts of the book. As I have said, it abounds in striking suggestions, and after so much adverse criticism I feel bound to call attention again to the genuinely scientific element of the book. Unfortunately this appears in so fragmentary a fashion that it is hardly possible to give a good example. The discussion of the mechanism of memory and attention, for example, though including some fanciful physiological hypotheses, is on the whole very instructive. Again the elucidation of the part taken by movement and motor impulse in intellectual operations generally, more particularly by help of the "language faculty," is a valuable extension of the well-known views of Mr. Bain and Mr. Lewes. In the handling of moral and practical questions, too, Mr. Cyples is often very successful, as when he mediates between Hedonism and Asceticism by pointing out that conduct has so much to do with the prevention of pain, that practically the pursuit of pleasure is the wrong rule of life. The grave problem of Evil is skilfully touched on too, if with a too apparent leaning to optimism (as one might expect from the doctrine of pain and the general drift of the book), and without an adequate apprehension of the point and stress of modern Pessimism, which is rather troubled with the evils of a highly civilised social state than with those of primitive life, which the author here ingeniously shows to have been sentimentally exaggerated. Of all the chapters of the volume those on the Æsthetic Emotions and Art (cc. x. and xxi.) appear to me to be best. Here where mysticism is apt to ride rampant Mr. Cyples is, oddly enough, sober and lucid. Though his views are not radically new, his working out of psychological principles into the form of laws of the beautiful is very well performed. Beauty is conceived as a perfected form of pleasure in which elements of pain are reduced to a minimum by being kept below the threshold of effectiveness. And, true alike to the tradition of the British school of æsthetics and to his fundamental conception of consciousness as the result of aggregation, he finds the essential

feature of lofty beauty in mass of pleasurable sensation together with volume of grateful reminiscence. Whether Mr. Cyples does not make too much of mere mass of consciousness and range of reminiscence, in explaining the æsthetic value of Typical Examples, of the Sublime, of Fitness, &c., may perhaps be doubted. So too I am inclined to think that his attempt to resolve the pleasure of harmony including rhythm into a satisfaction of nascent anticipation is pushed too far to the exclusion of other aspects. Nevertheless in bringing out this element he may be said to have made a valuable addition to æsthetic doctrine.

I have had occasion to remark on the author's cumbrous style. I must now add that he shows himself quite capable of writing clear and effective English when he likes. The chapters on Beauty and Art contain many examples of a really good style, and I cannot do better than close by quoting a specimen from a passage on the relation of the Sublime to the Terrible:—

"A mountain with no scars upon its sides telling of the rage of storms; no dizzying sheer descents of plunging precipice; no gulfs; no inaccessible peaks; but a mountain showing all gradual, smooth, shining—this would not be sublime in the second of the two senses above specified, no matter what its mere size. To give it sublimity of that kind you must mark it with violence. It needs, here and there, singeing and scarring with traces of the flaming thunderbolt; fringes of black struggling pines must show dwarfed and painful on the narrow edges of its unsheltering cliffs; you must hang somewhere amidst its higher snows the fatal avalanche, held only by creaking, faulty chains of ice, &c." (p. 734).

James Sully.

La Morale anglaise contemporaine. Morale de l'utilité et de l'évolution. Par M. Guyau. Ouvrage couronné par l'Académie des Sciences morales et politiques. Paris: Germer Baillière et Cie. 1879. Pp. xii., 417.

The study of the English school of moral philosophy has lately made great progress in France; and the appearance of such a book as M. Guyau's is one of the most satisfactory assurances of it. A circumstance which adds a special value to M. Guyau's work in this respect is that he is not an adherent of utilitarianism in any form. He has nevertheless thought it worth while to make its doctrines and development from Bentham to Herbert Spencer the subject of a full, careful, and fair-minded discussion. Whether one agrees with his criticism or not on particular points, one feels throughout that M. Guyau is in a region wholly removed from the superficial declamation officially stamped as philosophy in France not so very long ago. The book is divided into two parts, occupied with exposition and criticism respectively. In the first part the theories of English utilitarian moralists are set forth, those of Bentham, J. S. Mill, and Herbert Spencer having the chief place given to them. In the second and larger part their methods and results are criticised, and an alternative view of morality is indicated, but not fully stated. M. Guyau is not an advocate of intuitionism of the old-fashioned kind, but seems to

regard morality as the direction of the will to the working out of an ideal involved in the constitution of the world, and eminently in that of man, and possessing in some way an absolute value. Before going farther it is well to mention that this volume is a sequel to *La Morale d' Épicure*, reviewed by Mr. H. Sidgwick in MIND XVI., p. 582: it is developed, in fact, from the second part of the essay in its original form.

Almost unqualified praise may be given to M. Guyau's chapters of exposition. His account is lucid, pleasant to read, and accurate: in fact I do not know where else, even in English, so full and trustworthy an account of English utilitarianism is to be found. In so large a subject there are naturally points on which the reader may dissent from his judgment. For example, he seems to me to underrate considerably the importance of the legal and political aspects of Bentham's system. M. Guyau probably does not know the extent of Bentham's influence in England, not only on the scientific study of law but on the actual course of law reform and the general habit of modern legislation. Otherwise he would hardly be content with saying of Bentham: "Il a son mérite, comme le montre l'extrême influence qu'il a exercée sur la philosophie anglaise". Great as Bentham's weight in English philosophy has been, it is only half his legacy to England, and perhaps the lesser half. Again, M. Guyau dismisses Grote's *Fragments on Ethical Subjects* with half-a-dozen lines, regarding these essays as a mere restatement of Bentham's doctrine. This appears to me a misconception. Grote's treatment of the development of conscience and its relation to the social sanction, his careful separation of the matter from the form of morality, and above all the constant predominance of the social point of view, mark in my opinion a distinct advance. It is particularly to be observed that Grote speaks little of greatest happiness, and less of the sum of the individual's pleasures, but much of the welfare of the society. No doubt his work is fairly on the lines of the older utilitarian school: at the same time it gives a hand, if I mistake not, to the newer endeavours of Herbert Spencer, Darwin, and Clifford, to connect ethical theory with the general body of scientific knowledge by means of the idea of evolution. Coming in date of publication after Mr. Darwin and Mr. Spencer had spoken, Grote's *Fragments* naturally failed to attract all the attention they deserved. But I think they will ultimately have a much more considerable place in the history of ethical science than M. Guyau assigns to them. To Mr. Sidgwick M. Guyau gives as many pages as he has given lines to Grote. What he says is fair enough as a summary, but not happy as a review. First he calls *Methods of Ethics* the last and fullest exposition of utilitarianism—an odd thing to say of a work that criticises existing schools all round, and holds aloof from every one of them—and then, as if on reflection finding the expectations raised by this description hardly satisfied, he calls it a great expenditure of ingenuity for slender results. He seems to overlook the eminently critical character of Mr. Sidgwick's book; the first question is whether the

criticism is not worth having for its own sake. Pure criticism, however, is not congenial to French writers on philosophy (the only remarkable exception that occurs to me is M. Renan); and it must be allowed that Mr. Sidgwick has cultivated a naturally fine taste for pure criticism to a point at which few can share its pleasures. He seems now and then to find a positive luxury in suspense of judgment.

In explaining Mr. Herbert Spencer's ethical opinions M. Guyau had the unavoidable disadvantage of writing before the publication of *The Data of Ethics*. He has made a good use, however, of the other available materials, including of course the letter to J. S. Mill first published in Prof. Bain's *Mental and Moral Science*. Perhaps it would have been better not to cite anything from *Social Statics*, which does not belong to the series of works setting forth Mr. Spencer's matured doctrine, and in some respects is even opposed to his later conclusions. It is interesting to know what a competent and for this purpose sufficiently impartial observer from the outside thinks of the relation of Mr. Spencer's ethical theory to strict utilitarianism. He regards it as the crown and completion of the English empirical school: "Les systèmes de Bentham et de Stuart Mill tendent évidemment à s'absorber dans le système plus vaste de M. Spencer, qui leur laisse une place en son sein et les complète sans les détruire. C'est donc à tort, selon nous, que les partisans de l'utilité et les partisans de l'évolution continuent à former en Angleterre deux camps distincts." The fact of the separation existing for the present is not denied. M. Guyau's frank admission of the importance of the doctrine of evolution in its bearing on ethics must not be passed over: it might profitably be meditated by a good many would-be philosophers and critics here. "The hypotheses of evolution and natural selection," says M. Guyau, "have of late years attained such a degree of probability that we may look forward to the time when they will be as universally received as the Newtonian hypothesis of gravitation, for instance, already is. Hypotheses of this kind must be treated as facts proved or shortly to be proved. It becomes no less absurd to attempt to construct an ethical system without them than it would be to construct a system of astronomy on the hypothesis of the stars being immovable or the sun going round the earth."

Before saying anything of M. Guyau's criticism in detail, I should like to mention one point on which it seems to me to share a mistake not uncommonly made in ethical discussion. M. Guyau himself distinguishes the scientific from the practical side of morals. It is one thing to study the phenomena of human conduct with a view to scientific explanation, just as one studies any other set of phenomena —another to tell this and that man what in such and such circumstances he ought to do. Further, M. Guyau points out that while the analysis of moral feeling and action is a perfectly scientific problem, the practical rule of life always appears to elude science. This is in my opinion a remark of great importance, only M. Guyau himself does not give enough weight to it. For his subsequent criticism often assumes (as most criticism on the subject is wont to assume) that a

theory of ethics is bound to solve particular problems of conduct for particular persons, or at least to provide universal methods for solving them; and that every theory is a failure in so far as it cannot do this. Closely connected with this assumption we find another one which is often used with much rhetorical effect, namely, that practical morality depends on ethical theories. In the hands of certain writers, again, this is developed into the most confident demonstration that nobody has any business to be a commonly good man who does not accept the form of moral philosophy that happens to be favoured by the writer. Now this way of thinking involves a confusion which to me is so strange as to seem inexplicable: the only suggestion I can make towards accounting for it is that the immense practical interest of morality has made it very difficult to keep the scientific aspect distinct. For the better marking of the distinction, I would propose to appropriate the term 'Ethics' and its derivatives for the scientific analysis and exposition of conduct, whether on historical, physiological, or psychological grounds; and on the other hand to keep 'Morality' and the kindred group of words for the region of precept and command. Thus we have an art of morality existing, and cultivated with more or less success, in every society of men sufficiently advanced in the art of living to hold together at all, and a science of Ethics coming into existence and cultivated with more or less success when the society becomes sufficiently civilised to produce men who think systematically. Now the art obviously exists before the science; for morality must be well established before that security and leisure can be found which make ethical speculation possible. Again, ethical speculation arises just because morality is there as a subject-matter to be accounted for. Morality and its methods are therefore not dependent on Ethics, and the practical success of mankind in developing morality cannot depend on the success of philosophers in giving a satisfactory account of how it is done, or why they should do it. Unless indeed we suppose that men no sooner begin to philosophise than they cast away all their previous experience and govern themselves wholly by philosophical reasoning: but this (though even so it would apply to only a few) is manifestly contrary to the fact. The science of ethics arises in a moral community, as the science of optics arises among men who see, and physiology among men who breathe and eat and digest. I do not say that ethical theory has no influence on practical morality; it may have a good deal. Optics has given us telescopes and spectacles; physiology has given us rational medicine; and from ethics we learn much that is profitable for education and government. But a man of normal sight does not want optics to make him see; a man of sound organs does not want physiology to make him breathe and digest; nor does a right-minded man want ethics to make him know right from wrong. On the other hand, if abnormal sight is corrected by lenses, or abnormal conditions of organs by medicine and regimen, or moral infirmities by education and reformation, the result of the process depends on the knowledge of the persons who apply it, or by whose instruction it is used, not of those for whose benefit it is applied.

This being so, it seems to me irrelevant to object to a theory of ethics that it does not furnish us with a ready solution of this or that case of conscience. It is like objecting to Sir H. Maine's *Ancient Law* that it throws no light on unsettled points in the English law of real property. In the same way it does not sufficiently dispose of an ethical theory to say that it fails to give a rational demonstration of the "categorical imperative," or to assign a motive for right conduct which shall be efficient for all men in all circumstances. In fact it should seem obvious, as Mr. Balfour has lately pointed out, that no amount of reasoning can end in a command, much less in a command sure to be obeyed. The only imperative known to science is the hypothetical imperative which we may express (with Clifford, "Scientific Basis of Morals") in the form: "If you want so-and-so, you must do so-and-so". Science, again, can consider, may perhaps explain, why a normally constituted man wants, on the whole, to do what he perceives as *right*, and why he so often fails of so doing. But the absolute question—Why *should* I, or why *must* I do right?—is not a scientific question at all. Any seeming answer that can be given involves reference to some other standard, openly or tacitly assumed. And it will be found, I think, that these considerations apply with equal force to all ethical systems whatever. So M. Guyau seems to think too, though not quite on the same grounds; for, while he fully and acutely criticises the English empirical school, he likewise at least inclines to the opinion that the *a priori* construction of a system of morals is an impossible task. If on the one hand the will of God, if on the other hand the furtherance of the greatest happiness, be assigned as the reason for doing right, in either case it remains possible to ask: But why should I do the will of God? Why should I seek the greatest happiness? And there is evidently no end to the process; not even if the joys or terrors of a future life are thrown in to weight the balance in favour of morality. For it is notorious that the sanctions of heaven and hell are not always effectual even under the most favourable conditions. And this has been so far discovered by the practical instinct of mankind that the empirical connexion of specific precepts with specific sanctions has ever been treated by wise governors and educators as only a subordinate part of the cultivation of right-mindedness. Hence also many wise men have said in various ways that obedience to precepts is not righteousness, but only the beginning of righteousness. Righteous men are not they who obey moral precepts, but they whose conduct is the foundation of moral precepts. And therefore Dante said that the right mind is a law to itself:

> Libero, dritto, sano è 'l tuo arbitrio,
> E fallo fora 'l non seguir suo cenno;
> Perch' io te sopra te corono e mitrio.

But we may extract from the moral question, scientifically insoluble in that form, a number of properly scientific questions which are in divers ways implied in it. Such are these: What do I mean by *right*, what by *good?* Why do I want to do that which appears to me *right?* What account can be given of pleasure and desire, and of

their relation to the notions of good and right? How came the notion of right to be formed by me and my ancestors? Can it be accounted for by the facts of human experience? How far is it constant in form and in matter? These and such like questions constitute the subject-matter of ethical science. That they are worth answering, and that several generations of thinkers have found enough to do in answering them, will not be much disputed, at least by persons who take any sort of interest in philosophical inquiries. And we may perhaps be able to attend to them more closely and carefully if we can get rid of the flattering fancy that the morality of the civilised world hangs on our conclusions.

In M. Guyau's criticism there are not many points that will strike an English reader as in themselves new; and once or twice he falls into something like commonplace. It is hardly worth while now-a-days to assert, as if expecting utilitarians to deny it, that some kind of moral sense—however various its deliverances—is practically universal among all but the very lowest of mankind: in other words, that there is a roughly constant *form* of morality with all the variety of *matter*. Again, it is of little use to say: "je *désire* le plaisir, je puis *vouloir* la douleur," unless you can show that "*vouloir* la douleur" does not imply the refined pleasure of the sense of power and independence. But M. Guyau is always intelligent, he is never violent or frivolous, and he gives unity to the subject by taking a connected view of the English school as forming a historical movement in ethical speculation. Bentham, J. S. Mill, and Herbert Spencer are the leaders he deals with almost exclusively. Bentham stands for pure thoroughgoing utilitarianism in its earlier form, as Bentham made and left it. J. S. Mill is taken as exhibiting an effort to expand Bentham's rigid framework and assimilate ideas from other quarters. Mr. Herbert Spencer has, in M. Guyau's judgment, pushed the empirical treatment of ethics to its fullest limits, and spoken the last and most complete word of the English school. And it is on Mr. Spencer that M. Guyau spends his main strength. Not that his criticism of Bentham and Mill is slight or careless; but to a certain extent he plays them off against one another. As against Bentham he urges the difficulty of establishing a quantitative scale of pleasures; as against Mill's proposal to compare pleasures in quality as well as quantity he uses in turn Bentham's weapons. On this last point one of his remarks is worth special notice. Mill speaks of preferring particular kinds of pleasure to others without any sense of moral obligation; but this involves an assumption which at least needs to be justified. What if the judgment that one pleasure is preferable *in kind* to another be itself a moral judgment, resting on a sense that the one pleasure is morally superior to the other? in which case the test of moral superiority as a source of rational preferableness would still remain to be investigated. Even æsthetic pleasures, which seem at first sight to afford the strongest evidence for Mill's theory (since it is very difficult to think of them as commensurable in quantity either with other kinds of pleasures or with each other), have on closer examination a quasi-moral

character. The sacrifice of an æsthetic for a non-æsthetic pleasure begets a feeling approaching remorse: "tout ce qui est beau semble revêtir un caractère moral." The objection that if quality of pleasures is to be counted no hedonistic calculus is possible, and moreover we cannot tell who is to decide, is also strongly made by M. Guyau, but seems of less weight. For we have no particular right to expect ethics to provide us with a moral calculus; nor would ethics be worse off than any other science in being unable to point out with exactness the body of competent persons whose consent ultimately decides on the acceptance of doctrines. It may be said that Mill's scale of quality, to be established by the majority of sufficiently instructed opinions, is only a more elaborate form of Aristotle's frank appeal to the judgment of the reasonable or right-minded man. But after all may not one do worse than be content with being no wiser than Aristotle on a practical point of this nature? For my own part I am disposed to think (but this by the way) that the merit of Aristotle's work in ethics has been much underrated in recent times.

Coming to Mr. Herbert Spencer, M. Guyau calls attention to the analogy between his doctrine and Spinoza's. With Spinoza all action, including moral action, springs from the principle of self-maintenance. Mr. Spencer investigates this principle further, and finds that maintenance implies progress; there is no conservation without evolution. "M. Herbert Spencer," says M. Guyau, using the term positivist in a large sense as equivalent to non-transcendentalist, "est une sorte de Spinoza positiviste"; a remark which, with due allowance for its epigrammatic form, is no less just than acute. For the rest, I think the contrast between Mr. Spencer's deductive treatment of ethics and the inductive treatment of earlier utilitarianism is rather over-stated by M. Guyau; perhaps it is a little too much insisted upon by Mr. Spencer himself in *The Data of Ethics*. Utilitarians have never, that I know of, proposed to substitute a calculation of pleasure and pain in each individual case for general moral rules, though superficial critics have often assumed that they do so. If there is to be a calculation, it is for the scientific establishment of the rule as a general rule. Nor have they generally explained and justified the rules of morality otherwise than by deduction from more or less general propositions about human pleasures and pains. Again, Mr. Spencer has now presented his ethical theory in a manner less divergent from the utilitarian tradition than might have been expected; for he expresses it as a form of hedonism. There is the great difference that he does not accept pleasure, or "preferable consciousness," as an ultimate fact either in itself or for the purposes of ethics, but seeks to explain it, and gives a certain ethical weight to the explanation. Still, the passage from utilitarianism pure and simple to Mr. Spencer's doctrine, sometimes named by himself "rational utilitarianism," is less abrupt than readers of his earlier works might expect. Thus it is very necessary for the student of M. Guyau's book to supplement his account by reference to *The Data of Ethics*, though the imperfection is no fault of M. Guyau's.

The chief objection to Mr. Spencer's theory made by M. Guyau is the general objection to all empirical or derivative systems of ethics. If morality has not an absolute value, but is valuable only as the means to some further end, how can you tell that in particular cases immoral conduct may not attain that end as well or better? "The justice you offer us is an abstract mechanical sort of justice, produced by the equilibrium of social forces; but to give us *this* justice, injustice may do as well as any other way, or sometimes better." The answer is simply that if injustice did serve as well, it would no longer be injustice. But it does not; and if proof of this be demanded, there is indeed no formal proof, but only because the proof consists of the whole experience of mankind ever since there has been human society. It is almost like the puzzle of proving the uniformity of nature. Again, M. Guyau asks: Even when you have got your general rules, how can you prevent any enterprising person from investigating their value for himself? Certainly we cannot prevent him, nor ought he to be prevented; though M. Guyau seems to think it a tenet of deductive utilitarianism that he ought. A general moral rule is, *prima facie*, binding on every member of society in every case covered by the rule; and if he simply obeys it, society cannot condemn him, though it may be seen by persons of exceptional moral insight that the rule itself was in that case inadequate. On the other hand, if he thinks he can improve the rule he is free to try, of course at his own risk. Society, for obvious reasons, looks with great suspicion on exceptions to moral rules discovered by particular persons in their own interest. An opposite presumption is made in favour of conduct which is against the agent's apparent interest, and is perhaps carried too far. M. Guyau complains that utilitarianism in its latest phase does not give us any fixed and universal rule for attaining the chief end, however defined, of moral action; but we may admit the fact, and deny that there is anything to complain of. What we learn from Mr. Darwin and Mr. Spencer is that moral rules are not fixed and universal in the sense required by intuitionists. Moralists in all ages have said, "Be just"; but the conceptions of justice, and of the persons to whom justice is due, have been through the history of civilisation becoming both wider and more determinate. The only absolute morality conceivable when we accept the evolution of moral feelings and relations as a scientific doctrine must be, as Mr. Herbert Spencer says, a body of rules which would be applicable in an ideal society; and the development of existing "relative morality" will then be regarded as an effort to approach as nearly as actual circumstances allow to the ideal requirements of "absolute morality". How far an absolute morality in this sense can be constructed with our present materials, and of what practical use it would be, it would be out of place to discuss here.

M. Guyau further objects to the explanation of inherited moral instincts given by Mr. Spencer and Mr. Darwin; not that, as a scientific explanation, it is not true or important for the natural history of man, but that it lacks moral efficacy. It reduces the moral sense to a sort of hallucination; if our moral feelings depend on our inherited nervous

modifications, we are patients in a state of *obsession*: "la moralité n'est qu'une transformation suprême de ces hallucinations normales qui se trouvent chez l'homme le plus sain et qui sont une condition de la santé même." M. Guyau does not specify these normal and healthy illusions; does he mean such as, for example, our fixed belief of the reality of an external world, or our impression of seeing things in three dimensions? So long as morality is as real as the world we live in, it may suffice most people for practical use. And again, "nous sommes des hallucinés, qui prennent leurs idées fixes pour des réalités;" and the only advantage of the moral illusion is that it is useful. But I conceive there is a fallacy here. The moral sense cannot be a hallucination, for it is not a judgment or opinion at all. Conscience does not assert, it commands. And a command may be wise or foolish, but it cannot be true or false. The fact is there, however we explain it; the only room for illusion is in our philosophical interpretation. But, again, it is suggested that if a man has thus accounted for his conscience as a piece of the natural history of mankind, he may deliberately set to work to get rid of it, and what if he succeeds? It appears to me that this would be as hopeful an undertaking as if, having come to the conclusion that the fundamental assumptions of geometry have not the necessary, absolute, and universal kind of truth commonly ascribed to them, one should go to work to modify one's intuitions of space.

In his concluding chapter M. Guyau states quite frankly the difficulties of founding an ethical system on any transcendental assumption about free will. Transcendental propositions belong to a transcendental world, and avail nothing in the world of experience. "Le moi nouménal ne peut pas fonder la liberté du moi phénoménal; or c'est cette liberté qui m'importe, et c'est la seule dont j'aurais besoin pour établir une morale." The alternative (besides utilitarianism) is to regard freedom not as a power or cause, but as an ideal. Thus understood, freedom is the realisation of the highest tendencies of one's own being, so far as these tendencies are determined by the nature and circumstances of the individual or race considered; this doctrine of ideal freedom would coincide with the doctrine of evolution. But the striving towards freedom, self-development, perfection (all these are apparently equivalent from the proposed point of view) may be regarded as belonging not only to this and that individual and species, but to all living beings. Thus we should obtain an universal ideal of perfection, which would be the principal and sufficient cause of all rational action. I confess that this theory, save in so far as it is a repetition of Stoicism in modernised language, appears to me obscure; and M. Guyau gives us to understand, though he does not stop to criticise, that he is not himself satisfied with it. At the same time, the theory of evolution as applied to moral feelings and action is calculated to bring into prominence under a new light the Stoic conception of "following nature"; and also, as I think, to modify the notion of moral freedom very much in the sense indicated by M. Guyau.

F. Pollock.

VIII.—NEW BOOKS.

[*These Notes are not meant to exclude, and sometimes are intentionally preliminary to, Critical Notices of the more important works later on.*]

The Metaphysics of the School. By Thomas Harper, S.J., Vol. I. London: Macmillan, 1879. Pp. lxxx., 592

In this volume, to be followed by three others, Father Harper begins a systematic attempt to present to the modern student the metaphysical doctrine of the School, as embodied in the manifold works of its greatest thinker, Thomas Aquinas. The general plan of the work is borrowed from the *Metaphysics* of Suarez, who was as conspicuous in his later time among the methodisers of the scholastic doctrine as St. Thomas had been among its unmethodical constructors. The modern expositor, however, being concerned only with the strictly philosophical doctrine, out of all reference to *supernatural* theology, does not follow Suarez in mixing up indifferently the problems of natural theology with those of finite being. Natural Theology is here to be reserved for separate treatment in the closing division of the work. He also does not retain Suarez' cumbrous form of 'Disputation' any more than Thomas's form of 'Question,' but is content to preserve the old scholastic system and order in its substance —throwing the matter into the form of Propositions or Theses, and, at the end of each, stating "the objections brought against it (if any such there be), one by one, together with an answer to each objection which immediately follows after the exposition of the difficulty." The great length to which the whole work will run is partly caused by the author's anxiety to make his subject plainer by a copious use of illustrations, but he protests against the notion that so stupendous a system of thought as St. Thomas's can be brought within the compass (as some one desired) of "a moderately sized octavo". And certainly, nobody will have a right to be anything but grateful to him if, even within four such big volumes as the present, he can tell the present generation all that he thinks it so much needs and is wistful to know of "that ancient doctrine [Aristotelian before it was Scholastic] which has stood the test of above two thousand years, and calmly holds its own spite of the unmeasured calumnies and copious scorn of interested adversaries". A large part of the author's long and sufficiently discursive Introduction is taken up with a forcible reply to some of these modern "calumnies". It is easy for him to prove that most of those who, from Hobbes downwards, have decried the School-philosophy, knew very little about it; and, only, there does not appear, on his own side, an intelligence of the reasons why, when a certain time came, the best heads, Catholic as well as Protestant, were naturally diverted from it, and might easily pass into the mood of undiscriminating or ignorant depreciation. However, before venturing such a remark about Father Harper's appreciation of Modern Philosophy and

Science, it might be both fairer and wiser to wait for his Second Volume, in which he hopes to convince the reader that St. Thomas's "teaching with regard to the genesis of the material universe, the primordial constituents of bodies and the generation of man harmonises wonderfully with the inductions of modern experimentalists". Of the nine books that will form the whole work, the present volume covers three: (1) of the Definition of Metaphysics, (2) of Being, (3) of the Transcendental Attributes of Being. In the remaining volumes will be treated, in succession, (4) the Principles of Being, (5) the Causes of Being, (6) the Primary Determinations of Being, (7) and (8) the Categories of Aristotle, (9) Natural Theology. A Glossary of Scholastic terms used in the present volume is given at the end (pp. 571-89), to be added to, as there is occasion, in the later volumes.

The Emotions. By JAMES MCCOSH, D.D., LL.D., President of Princeton College. London: Macmillan, 1880. Pp. 255.

As Dr. McCosh explained in a Note in MIND VII., which reappears with some slight change as the Introduction to the present volume, there are in his view four elements involved in emotions: (1) An affection, motive principle or appetence; (2) an idea of something as fitted to gratify or disappoint a motive principle or appetence; (3) a conscious feeling; (4) an organic affection. Nobody, he thinks, has previously given due prominence to all these elements at the same time. (1) The Primary Appetences, forming the basis of all emotion, are, according to him, the following: Love of Pleasure and Aversion to Pain, Promoting Good of others, Personal Attachments, Tastes and Talents tending to act, Bodily Appetites, Love of Society, Love of Esteem, Love of Power, Love of Wealth, Æsthetic Feeling, Moral Sentiment. (2) These being gratified or disappointed by *objects*, the Ideas calling forth emotions are of the nature of Phantasms—not abstract or general notions, though it is not meant that the representation is always of strictly individual objects; aggregates or collections of individuals, being concrete, and whatever is associated with individual things are equally appetible or inappetible. Then comes (3) the fact of Conscious Excitement, in the form either of Attachment or Repugnance—a mental act accompanied by, but never to be confounded (as Dr. McCosh thinks it commonly is confounded by "physiologists") with (4) the Organic Affection, "the seat of which seems to be somewhere in the cerebrum whence it influences the nervous centres, producing soothing or exciting and at times exasperating results." Having given in Book I. his detailed account of these "Elements," the author proceeds in Book II. to the "Classification and Description of Emotions." Fixing upon the Idea involved in all emotion as the ground of distribution, he makes a fundamental division of Emotions as directed to (1) Animate or (2) Inanimate Objects. The former class is further subdivided (after Thomas Brown) into *(a)* Retrospective, *(b)* Immediate and *(c)* Prospective Emotions according as the "ideas" are considered as directed to the past, present or future; and further under each head distinction

is made of the *egoistic* or *altruistic* reference of the feeling. The second main class coincides with all those emotions usually designated Æsthetic. Finally, in Book III., the "Complex Emotions" are dealt with, meaning those continuous modes that have been called Affections, Passions, &c.

The author starts upon his whole inquiry with a complaint that the word Feeling is made to "embrace two such different mental properties as Sensation, on the one hand, and Emotion, as of fear, hope, grief and anger, on the other." Declaring it, thereupon, "desirable to have the emotions separated from the feelings," he apparently identifies Feeling with Sensation; but this does not hinder him from finding the central fact of Emotion to be "a conscious feeling," and generally from using the words Emotion and Feeling as interchangeable. If it be true, then, as he further says in his preface, that "the vagueness of the idea" of Feeling "favours the tendency on the part of the prevailing physiological psychology of the day to resolve all feeling, and our very emotions, into nervous action, and thus gain an important province of our nature to materialism," it is difficult to see how his own use of the word can prevent that consequence. The book, as a whole, can hardly be said to throw any new light on the subject, but it contains many interesting observations, and is pleasantly written.

Introduction to the Science of Language. By A. H. Sayce, Deputy Professor of Comparative Philosophy in the University of Oxford. 2 vols. London: Kegan Paul, 1880. Pp. viii., 441, 421.

This "attempt to give a systematic account of the Science of Language, its nature, its progress, and its aims," appeals to the philosophical hardly less than to the philological student. The author begins with a survey of "Theories of Language," going back to the traces of the first reflective efforts of Babylonian and Assyrian grammarians, and bringing down the account to the latest philosophical speculations of German origin. He then opens up, in a long chapter, his own view of "The Nature and Science of Language," defining Language provisionally as "consisting of certain modulations of the voice, variously combined and arranged, which serve as symbols for the thoughts and feelings we wish to express"; and urging more particularly that, as the Sentence is the unit of significant speech, its different forms, "that is to say, the different modes in which the relations of subject, object, and verb are denoted will constitute the only sound basis for classifying speech". "The three Causes of Change in Language"—Imitation, Emphasis, Laziness—are next set forth at length in a separate chapter, followed by five others constituting the main body of the work. These (with various appendices) treat, in order, of "The Physiology and Semasiology of Speech (Phonology and Sematology)," "The Morphology of Speech," "Roots," "The Inflectional Families of Speech," "The Agglutinative, Incorporating, Polysynthetic, and Isolating Languages". Two chapters of a more general character complete the work, entitled "Comparative Mytho-

logy and the Science of Religion," "The Origin of Language, and the relation of the Science of Language to Ethnology, Logic, and Education". In the last, he maintains, as the outcome of all the successive inquiries directed to the question of origin, that Language is now seen to be "the product not of one cause, but of a combination of several. Grammar has grown out of gesture and gesticulation, words out of the imitation of natural sounds and the inarticulate cries uttered by men engaged in a common work or else moved by common emotions of pleasure and pain." Such as it is, "the faculty of speech, whether exercised or unexercised, is the one mark of distinction between the man and the brute. All other supposed marks of difference—physiological, intellectual, and moral—have successively disappeared under the microscope of modern science. But the prerogative of language still remains, and with it the possession of conceptual thought and continuous reasoning." True, "the difference between the beginnings of language which we detect in animals and the first attempts at speech in early man is but a difference in degree; but differences of degree become in time differences of kind". As regards Logic, Professor Sayce would contend (after Mr. Sweet) that that science (meaning formal logic) is in an evil case—both suffering itself and harming the science of language—so long as its professors do not recognise that it must be based on the essential principles of language as made out by general linguistic science, instead of reflecting the grammatical forms of a particular speech, misinterpreted, too, as these were by ignorant Greek grammarians. Professor Sayce does not sufficiently develop his view; but when it is said that "had Aristotle been a Mexican, his system of logic would have assumed a wholly different form," the obvious remark occurs that Aristotle might still be doing a very useful and necessary work in devising a logic accommodated to the kind of language in which he actually thought, and that those whose speech is of the same fundamental type may find their profit in continuing to regulate their thinking by means of that logic. The two volumes are marked by great freshness and vigour of thought.

Aristotle. By George Grote, F.R.S., &c. Edited by Alexander Bain, LL.D., and G. Croom Robertson, M.A. Second Edition with Additions. London: Murray, 1880. Pp. xiii. 681.

"This Edition is an exact reprint of the First Edition [1872], with the addition of two important Essays on the *Ethics* and *Politics* of Aristotle, which were found among the author's papers. They were originally published in 1876, in *Fragments on Ethical Subjects*, but would have been included in the First Edition of this work, had they been discovered in time."

Teutonic Mythology. By Jacob Grimm. Translated from the Fourth Edition, with Notes and Appendix, by James Steven Stalybrass. Vol. I. London: Swan Sonnenschein and Allen, 1879. Pp. viii., 437.

The translation of Grimm's standard work is here begun by a man

who brings exceptional qualifications to the performance of an exceptionally difficult task. Two more volumes will follow, the last including not only Grimm's own Appendix to his second and third editions, but also, in a carefully digested form, the Supplement added in the fourth edition, after Grimm's death, from his note-books, by Professor E. H. Meyer.

The A. B. C. of Philosophy. A Text-book for Students. By Thomas Griffifth, A.M., Prebendary of St. Paul's. London : Longmans, 1880. Pp. 132.

"This volume owes its origin to two deep convictions. First, that the Philosophy of an age materially affects the thought of that age. And next, that true Philosophy can neither be understood in itself, nor help us to the understanding of the false, unless we study it systematically as an organic whole." . . . The aim as regards the second conviction "is not to throw out fragmentary scraps of knowledge, but to evolve in regular succession, from the earliest germs of thought, the gradually ripening growths of truth. Beginning with those concomitant phenomena which beget the notion of Extension in Space (the Statics of Psychology), and proceeding to those consecutive phenomena which beget the notion of Change in Time (the Dynamics of Pyschology), our investigation culminates in those phenomena of co-ordination which proclaim the presence, both in Space and Time, of an adjusting, harmonising, unifying Mind." The work is in five chapters :—The Necessity of Philosophy; The Problems of Philosophy; Matter; Motion; Mind; followed by an Appendix of Notes and Authorities.

Path and Goal. A Discussion on the Elements of Civilisation and the Conditions of Happiness. By M. M. Kalisch, Ph. D., M.A. London : Longmans, 1880. Pp. 510, 138 (Notes).

A discussion among a number of men of different races brought together under the roof of a descendant of a family of Spanish Jews in London. The subjects are the following :—The Book (of Ecclesiastes); The Cynic and the Stoic; The Stoic and the Christian; Epicurus and Darwinism; The Dignity of Man; God, Soul, Immortality; Immortality; Pantheism; Pessimism; Idealism and the Goal.

The Academics of Cicero. Translated by James S. Reid, Fellow and Assistant Tutor of Gonville and Caius College, Cambridge. London : Maemillan, 1880. Pp. 107.

A translation intended to form an adjunct to a revised issue of Mr. Reid's edition of the Latin text, with explanatory notes, now in the press, but first published separately for a special academic reason, and also because he thought "a trustworthy rendering of this important book might prove to have some interest and value for those whose special study is philosophy rather than classics".

"I am aware (adds the translator) that for such students the history of ancient thought has hitherto practically closed with the name of Aristotle. But it is, I think, beginning to be felt, in Germany at least, that the vast historical importance of the post-Aristotelian systems entitles them to more

attention than they have hitherto received. In any case, whatever may be thought of the later Greek speculation as a whole, the controversy presented to us in Cicero's *Academics* is one which ought to possess an enduring interest for the modern student of philosophy. Though the struggle between philosophic scepticism and philosophic dogmatism covered a much smaller field in ancient than it has occupied in modern times, it yet opened up to the ancients problems which are being discussed to-day as vigorously as they were discussed then. There is no ancient work (if we exclude the writings of Sextus Empiricus) which presents to a greater extent than the *Academics* points of resemblance to the modern literature of philosophy."

An Introduction (pp. 5) and a number of Notes (pp. 15) "are intended to smooth the chief difficulties likely to stand in the way of a modern reader".

History of Materialism and Criticism of its Present Importance. By Frederick Albert Lange, late Professor of Philosophy in the Universities of Zürich and Marburg. Authorised Translation by Ernest Chester Thomas, late Scholar of Trinity College, Oxford. In Three Volumes. Vol. II. London: Trübner, 1880. Pp. 397.

The present volume of this careful translation of a very important book includes the Materialism of the 18th century, the Movement of Modern Philosophy from Kant, and part of the section entitled by Lange "The Natural Sciences". The publication has been delayed by the Translator's illness, but the third and concluding volume will very speedily follow.

La Logique de l'Hypothèse. Par Ernest Naville, Correspondant de l'Institut de France. Paris: Germer Baillière, 1880. Pp. 288.

The author first conceived the idea, in studying the philosophy of Bacon, as far back as 1844, that both Bacon and Descartes erred in not seeing that, though observation and reasoning are the indispensable conditions of a discovery, yet the discovery itself has a spontaneous character and always begins in the form of a supposition. Twenty years later the idea was confirmed in the course of metaphysical inquiries, and the author was under the impression that he had made a distinct advance in logical theory. On going further, indeed, he found that others, notably Claude Bernard, Liebig, Chevreul and Whewell, held similar views, and that long previously Galileo had explicitly recognised the place of hypothesis in science. Still it seemed that nobody had yet affirmed the presence of hypothesis in all the elements of science without exception. This thesis which, the author thinks, must profoundly modify the theory of method, he has more than once sought to maintain in courses of public lectures at Geneva; and the present work now embodies the mature results of his thought on the subject. Notwithstanding the importance he assigns to hypothesis, however, his purpose, in view of the state of thought at the present day, is rather to control than to encourage its

exercise. "The special character of the present movement of thought is that the systematic spirit presents itself in the false guise of empiricism. Simple hypotheses are no longer taken, as by Descartes, for deductions *a priori;* but they are regarded as solid inductions, as theories definitively established. . . . Now the logic of hypothesis keeps us from forgetting that our scientific ideas are ever in their origin anything but suppositions, or have any other value than what they draw from confirmation by experience." The work is in three parts: (1) "The Place of Hypotheses in Science"; (2) "The Conditions of Serious Hypotheses"; (3) "Directing Principles of Hypotheses"; followed by a number of solutions of particular difficulties raised on occasion of the author's courses of lectures.

De l'Invention dans les Arts, dans les Sciences et dans la Pratique de la Vertu. Par E. Joyau, Docteur-ès-Lettres, Ancien Élève de l'École Normale. Paris: Germer Baillière, 1879. Pp. 213.

The author is here concerned about Imagination, not as the reproductive faculty whose mode of working has been carefully investigated and is well understood, but as the creative faculty which has generally been held to elude all definite investigation and to be subject to no determinate law. He would treat the reproduction of images, according to the commonly recognised laws of association, under the head of Memory, and reserve the name Imagination for the quite different tendency, inherent to the mind, whereby it is borne spontaneously from one sentiment, thought or action, to another sentiment, thought or action, logically connected with the former. The law involved is that which several philosophers, including Hume, have noted in passing but never brought fully to light; namely, that often, if one idea arise after another in the mind, it is because there is between them a relation of cause to effect, of principle to consequence, of means to end. In the author's view, it is a profound error to oppose Imagination and Reason to one another. Everything suggested by the creative imagination gives full and entire satisfaction to the reason. The two faculties are identical and differ only in our way of looking at them: "Imagination is the mind's faculty of making progress; Reason is the knowledge we have of the laws of our progress". The scope of the author's whole inquiry is thus described by himself:—

"We shall first show that there is in us a natural tendency to pass spontaneously and without external stimulus from one psychological phenomenon—sentiment, thought, or action—to another which is the logical consequence of the first; we shall endeavour to explain the existence of this inclination; we shall indicate the principal opposing forces that arrest or divert its development; finally we shall show how in certain men and at certain moments the intellectual activity surmounts this or that obstacle and realises this or that progress.

"We shall then examine the methods followed by men in the study of the sciences—physics, natural history, mathematics; we shall consider the arts and the practice of virtue; we shall see that all our discoveries, all our

forward steps, are due to the creative imagination whose mode of action and law are ever the same.

"Finally, we shall come to the examination of the products of imagination—true scientific theories, beautiful works, good actions. Everywhere we shall remark the same characters—an extreme simplicity and a great logical rigour."

La Physiologie de l'Esprit. Par F. Paulhan. Avec 10 Figures dans le texte. "Bibliothèque Utile". Paris: Germer Baillière. Pp. 190.

The reader has here, for sixpence, in handy pocket-form, a remarkably good summary of the main results of recent psychological inquiry. After an Introduction, setting out with great clearness the relation of Psychology, as now understood, to general Philosophy, the little work is disposed in five chapters entitled (1) The Nervous System and Mind, (2) Statical Study of Mind, (3) Dynamical Study of Mind, (4) Organisation of Mind, (5) Summary and Conclusion: a Question of psychological Philosophy [the Relation of Mind and Matter].

Logik. Eine Untersuchung der Principien der Erkenntniss und der Methoden wissenschaftlicher Forschung. Von Wilhelm Wundt, Professor an der Universität zu Leipzig. Erster Band. *Erkenntnisslehre.* Stuttgart: Enke, 1880. Pp. 585.

A book by Professor Wundt, even on Logic, will naturally attract a good deal of interest, and a critical notice of the present work will be given in this journal, probably in the next number. As preliminary, it will be sufficient to say of its general tendency that the Formal aspect of the Science is here distinctly treated as subordinate to the investigation of Material Truth. The author's course is directed mid-way between the two dangers of the purely Formal view on the one hand, and the 'Metaphysical or Dialectical' on the other: Formal Truth is not taken to be the limit of Logic's interest, nor on the other hand is the (more or less concealed) assumption of identity between Thought and Existence considered fit to serve as a foundation. The justification, as well as the building-ground, of Logic, is found in the methods of the separate sciences. 'Scientific' Logic, as thus opposed to Formal and to Metaphysical, is a *part* of Philosophy—neither outside it, nor coincident with it. Logic and Metaphysics are regarded as the two halves of theoretical Philosophy, Logic being that part which stands in the closer relation to the separate sciences. The whole system is divided, in the first place, into (Vol. I.) *Erkenntnisslehre*, and (Vol. II.) *Methodenlehre.* In the present volume, first in order comes an examination of the psychological foundations of Logic and *Erkenntnisstheorie;* next, a treatment of the Logical Forms; and finally a discussion of the Principles of Knowledge. Out of these three subjects are made six divisions of the book:—(1) On the Development of Thought; (2) On Notions; (3) On Judgments; (4) On Syllogistic Forms; (5) On the First Principles of Knowledge; and (6) On the Laws of Knowledge. The author shows himself, in more than one point, anxious to meet the prejudices or disabilities of

the individual reader half-way: those who feel dissatisfied with Prof. Wundt's arrangement of the subjects can, if they like, take the discussion of the First Principles and the Laws of Knowledge before that of Notions, Judgment, and Syllogistic Forms; and non-mathematical students may have comfort in the fact that Symbols are relegated to two separate chapters, which may be entirely omitted without detriment to the course of their study of the work. The psychology at the beginning will naturally render the book attractive to all who recognise the chief services to science and philosophy with which Prof. Wundt's name is commonly coupled; while most of the fifth and sixth parts, and especially the two last chapters (on Causation and Teleology), will be found useful to those also whose interest in these subjects is general rather than special. [A. S.]

Begriffsschrift, eine der arithmetischen nachgebildete Formelsprache des reinen Denkens. Von Dr. Gottlob Frege, Privatdocenten der Mathematik an der Universität Jena. Halle: Nebert, 1879. Pp. x., 88.

Dr. Frege's work seems to be a somewhat novel kind of Symbolic Logic, dealing much more in diagrammatic or geometric forms than Boole's. A certain arrangement of horizontal and vertical lines connected with letters or symbols expresses the truth or falsity of propositions involving those letters or symbols; the latter by themselves standing for terms or combinations of terms.

Symbolic systems are, I know, very difficult to judge by those unfamiliar with them; they will almost necessarily appear cumbrous and inconvenient to those who have been accustomed to make use of some different system. But, making all due allowance for these considerations, it does not seem to me that Dr. Frege's scheme can for a moment compare with that of Boole. I should suppose, from his making no reference whatever to the latter, that he has not seen it, nor any of the modifications of it with which we are familiar here. Certainly the merits which he claims as novel for his own method are common to every symbolic method. For instance, he complains that logicians have not duly employed distinct sets of symbols for terms and for operations, and he makes use of letters and of lines for this purpose: in which there would seem no novelty surely to any one who had met with such expressions as $x(y+z)=xy+xz$ as significant of logical operations. Similarly he calls attention to the fact that, on his scheme, the distinction, so important in grammar and on the predication-view of ordinary logic, between subject and predicate loses all its significance, that hypothetical and disjunctive propositions become equivalent to categorical, and so on; all these being points which must have forced themselves upon the attention of those who have studied this development of Logic. I have not made myself sufficiently familiar with Dr. Frege's system to attempt to work out problems by help of it, but I must confess that it seems to me cumbrous and inconvenient. [J. V.]

Der Realismus der modernen Naturwissenschaft im Lichte der von Kant und Berkeley angebahnten Erkenntnisskritik. Kritische Streifzüge von Dr. Anton von Leclair. Prag: Tempsky, 1879. Pp. ix., 282.

Herr von Leclair's book must be pronounced rather a piece of patchwork. The substance of it, an essay on the idealist view as opposed to modern scientific realism, extending over pp. 1-73, is a brief, partly polemical, partly expository, statement of the Berkeleyan *v.* Kantian doctrine regarding the object of perception. So far as critical investigation of the theoretical assumption of natural science is concerned, Leclair's result does not differ from, while his method is distinctly inferior to, that contained in the late Professor Herbert's work, noticed in Mind XVI. The greater part of the work, pp. 77-273, is taken up with long extracts from various scientific or philosophical writers, interspersed with criticisms and raising some questions of interest, but on the whole quite superfluous in quantity. [R. A.]

Gedanken über die Socialwissenschaft der Zukunft. Von Paul v. Lilienfeld. Vierter Theil: "Die sociale Physiologie". Mitau: Behre, 1879. Pp. 496.

The author continues in this fourth volume the comprehensive work whose earlier parts were mentioned in Mind IX., p. 152. His present subject is "the establishment and elucidation of the Laws of Development of the Social Organism from the physiological point of view".

Die Frage nach der geschichtlichen Entwickelung des Farbensinnes. Von Dr. Anton Marty, a.o. Professor der Philosophie an der k. k. Universität zu Czernowitz. Wien: Gerold's Sohn, 1879. Pp. 160.

This is a remarkably methodical and interesting investigation of the question of the historical development of the colour-sense. Occupying himself more especially with the question of *historical* development in man, the author is led to substantially the same conclusions as have been enunciated in this country by Mr. Grant Allen and others. All the direct evidence, deductive or historical, leaves, he thinks, no doubt that the cultivated nations of antiquity and previous races of men possessed a fully developed colour-sense. But the power of *judging* colours and the interest in *naming* them have been only slowly developed; there has also been a transformation of *feeling* for colours. The author makes a rather elaborate psychological analysis in defence of this position, and also enters at some length into the æsthetical question of poetic diction as regards the language of Homer, &c. So far as he raises the question of previous development in the lower animals, before the power of distinguishing colour-qualities was attained and passed on in constant fashion, he argues that the development did not take place in the order from red to violet, as Geiger and Magnus have supposed it in man; also that it was determined by variation and natural selection rather than, as these again supposed, by individual adaptation under the influence of light. The author, in his arguments, adopts the newer classification of colours put forward by Mach and Hering.

IX.—MISCELLANEOUS.

We call attention (in connexion with an advertisement on the cover of the present number) to a scheme for the popularisation of Philosophy, and the diffusion of accurate though condensed information regarding the principal philosophers of modern times, projected by Professor Knight of St. Andrews University, and to be carried out by the Messrs. Blackwood, the publishers of "Ancient and Foreign Classics for English Readers". The following extract from the prospectus will indicate the nature of the scheme :—

"The aim of this Series will be to tell the general reader—who cannot possibly peruse the entire works of the Philosophers—who the founders of the chief systems were, and how they dealt with the great questions of the Universe; to give an outline of their lives and characters; to show how the systems were connected with the individualities of the writers, how they received the problem of Philosophy from their predecessors, with what additions they handed it on to their successors, and what they thus contributed to the increasing purpose of the world's thought and its organic development; as well as to illustrate the questions that engrossed them in the light of contemporary discussion.

"The Series will thus unfold the History of Modern Philosophy under the light cast upon it by the labours of the chief system-builders. In each work it will be the aim of the writers to translate the discussion out of the dialect of the Schools, into the language of ordinary life. If the philosophical achievements of such writers as Descartes, Spinoza, Bacon, Hobbes, Locke, Leibnitz, Butler, Berkeley, Hume, Kant, Fichte, Hegel, Comte, and Hamilton (not to refer to other names), were thus recorded,—and the discussion popularised without being diluted,—it is believed that the Series would form a useful assistance to the student of Philosophy, and be of much value to the general reader."

The *Revue Philosophique* of January has the following note :—"The Academy of Moral and Political Sciences (philosophical section) had to nominate a foreign associate in place of Professor I. Fichte. It might have chosen amongst Messrs. Spencer, Bain, Wundt, Hartmann, &c.; it did elect M. Vicenzo di Giovani, professor in the Archiepiscopal Seminary of Palermo."

The Journal of Speculative Philosophy.—Vol. XIV. No. 1. 'Kant's Critic of Pure Reason, criticised and explained by himself' (tr. from *Proleg.*, App.) M. Tuthill—'The Method of Thought'. J. H. Stirling—'Professor Caird on Kant'. E. Caird—'Kant's Deduction of the Categories, with special relation to the views of Dr. Stirling'. Notes and Discussions. Book notices.

Revue Philosophique.—Vme Année, No. 1. A. Espinas—'Le sens de la couleur : son origine et son développement' (I.). G. Séailles—'Philosophes contemporains : M. Vacherot' (I.). E. Boirac—'Les problèmes de l' éducation'. Notes et Documents (Dr. S. Wilks—'Notes sur l' histoire de mon perroquet, &c.'). Analyses et Comptes-rendus (H. Spencer, *The Data of Ethics;* A. Macfarlane, *Principles of the Algebra of Logic*, &c.). Rev. des Périod. Programme des cours de philosophie dans l' enseignement supérieur en France. No. 2. J. Delboeuf—'Le sommeil et les rêves. II. Leurs

rapports avec la théorie de la mémoire'. A. Espinas—'Le sens de la couleur, &c.' (fin). G. Séailles—'Philosophes contemporains : M. Vacherot' (fin). Analyses et Comptes-rendus. Notices bibliographiques. No. 3. V. Brochard—'La loi de similarité dans l' association des idées'. D. Nolen—'Les maîtres de Kant. III. Kant et J. J. Rousseau'. P. Tannery—'Thalès et ses emprunts à l' Égypte'. Notes et Documents (M. Guyau—'La mémoire et le phonographe'; Dr. P. Despine—'Le somnambulisme de Socrate'. Analyses et Comptes-rendus (C. S. Wake, *The Evolution of Morality*, &c.). Rev. des Périod.

La Critique Philosophique.—VIIIme Année, Nos. 46-52; IXme Année, Nos. 1-5. C. Renouvier—'De la méthode en histoire de la philosophie' (46); 'Les labyrinthes de la métaphysique : Le déterminisme et le libre arbitre—Malebranche' (47); 'L' évolution et le transformisme dans la philosophie de l' antiquité' (51); 'Le déterminisme stoïcien et ses adversaires' (1); 'La doctrine d' Épicure d' après M. Guyau' (50); 'Les origines et l' évolution de la famille suivant M. Spencer' (2); 'Kant et Schopenhauer : Le principe de l' obligation en morale' (2); 'L' infinité de l' espace et du temps dans la métaphysique de M. Lotze' (3); 'La question du temps infini dans la métaphysique de M. Lotze' (45). J. Milsand—'L' envers du positivisme' (49); 'L' évolutionnisme et la mythologie aryenne : L' idolâtrie des ressemblances' (50); 'Le côté moral de l' évolutionnisme' (52); 'Une causerie : Comment se transmettent les convictions qui influent sur la vie' (4); 'Le spiritualisme et le positivisme' (5). F. Pillon—'L' acquisition du langage selon M. Taine' (51); 'un livre de bonne foi (Savatier-Laroche, *Études Morales*)' (3). Bibliographie.

La Filosofia delle Scuole Italiane.—Vol. XX. Disp. 3. La Direzione—'Ai Lettori'. T. Mamiani—'Filosofia della realtà'. G. Iandelli—'Del sentimento'. M. Panizza—'Antropologia: La fisiologia del sistema nervoso nelle sue relazioni coi fatti psichici'. Bibliografia. Vol. XXI. Disp. I. F. Bonatelli—'Del Sogno'. T. Mamiani—'Della filosofia francese contemporanea.' F. Ramorini—'Di alcune argomentazioni contenute nel Protagora di Platone'. Bibliografia.

Zeitschrift für Philosophie, &c.—Bd. LXXVI. Heft 1. E. Rehnisch—'Zur Kritik herkömmlicher Dogmen u. Anschauungsweisen der Logik, insbesondre des Lehrstücks vom Schluss'. J. B. Weiss—'Untersuchungen über F. Schleiermacher's Dialektik (II. ii. 2). W. Wiegand—'Leibniz als Religions-Friedenstifter'. Recensionen. Nekrolog (A. Jung—'Immanuel Hermann v. Fichte'). Bibliographie.

Zeitschrift für Völkerpsychologie u. Sprachwissenschaft.—Bd. XI., Heft 4. F. Misteli—'Lautgesetz u. Analogie: Methodisch-psychologische Abhandlung'. Beurtheilung.

Philosophische Monatshefte.—Bd. XV. Heft 10. A. Stadler—'Kant u. das Princip der Erhaltung der Kraft'. E. v. Hartmann—'Ist der Pessimismus wissenschaftlich zu begründen?' Recensionen (Flint, *Anti-theistic Theories;* &c.). Litteraturbericht. Bibliographie, &c. Bd. XVI. Heft 1, 2. G. Knauer—'Seele u. Geist' (I. II.) J. Baumann—'Historische u. kritische Bemerkungen zum Zweckbegriff'. H. Vaihinger—'Die Erdmann-Arnoldt'sche Controverse über Kant's Prolegomena'. Recensionen. Literaturbericht. Bibliographie. &c.

Vierteljahrsschrift für wissenschaftliche Philosophie.—Bd. IV. Heft 1. E. Laas—'Die Causalität des Ich, (I.). F. Tönnies—'Anmerkungen über die Philosophie des Hobbes' (II.). Schmitz-Dumont—'Zur Raumfrage'. A. Spir—'Drei Grundfragen des Idealismus: II. Von dem Unterschied zwischen der normalen und der empirischen Natur der Dinge'. Recensionen (H. Sidgwick, *The Methods of Ethics*, "Ethics" in *Encyclopædia Britannica*) Entgegnungen (A. Horwicz, W. Wundt, 'Die Priorität des Gefühls'; W. Wundt, 'Bemerkung zu dem Aufsatz des Herrn B. Erdmann "Zur zeitgenössischen Psychologie in Deutschland"'). Selbstanzeigen.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—STATISTICS OF MENTAL IMAGERY.

An outline is given in the following memoir of some of the earlier results of an inquiry which I am still prosecuting, and a comparatively new statistical process will be used in it for the first time in dealing with psychological data. It is that which I described under the title of "Statistics by Intercomparison" in the *Philosophical Magazine* of Jany., 1875.

The larger object of my inquiry is to elicit facts that shall define the natural varieties of mental disposition in the two sexes and in different races, and afford trustworthy data as to the relative frequency with which different faculties are inherited in different degrees. The particular branch of the inquiry to which this memoir refers, is Mental Imagery; that is to say, I desire to define the different degrees of vividness with which different persons have the faculty of recalling familiar scenes under the form of mental pictures, and the peculiarities of the mental visions of different persons. The first questions that I put referred to the illumination, definition and colouring of the mental image, and they were framed as follows (I quote from my second and revised schedule of questions):—

"Before addressing yourself to any of the Questions on the opposite page, think of some definite object—suppose it is your breakfast-table as you sat down to it this morning—and consider carefully the picture that rises before your mind's eye.

1. *Illumination.*—Is the image dim or fairly clear? Is its brightness comparable to that of the actual scene?

2. *Definition.*—Are all the objects pretty well defined at the same time, or is the place of sharpest definition at any one moment more contracted than it is in a real scene?

3. *Colouring.*—Are the colours of the china, of the toast, bread-crust, mustard, meat, parsley, or whatever may have been on the table, quite distinct and natural?"

There were many other questions besides these, of which I defer mention for the moment.

The first results of my inquiry amazed me. I had begun by questioning friends in the scientific world, as they were the most likely class of men to give accurate answers concerning this faculty of visualising, to which novelists and poets continually allude, which has left an abiding mark on the vocabularies of every language, and which supplies the material out of which dreams and the well-known hallucinations of sick people are built up.

To my astonishment, I found that the great majority of the men of science to whom I first applied, protested that mental imagery was unknown to them, and they looked on me as fanciful and fantastic in supposing that the words 'mental imagery' really expressed what I believed everybody supposed them to mean. They had no more notion of its true nature than a colour-blind man who has not discerned his defect has of the nature of colour. They had a mental deficiency of which they were unaware, and naturally enough supposed that those who were normally endowed, were romancing. To illustrate their mental attitude it will be sufficient to quote a few lines from the letter of one of my correspondents, who writes:—

"These questions presuppose assent to some sort of a proposition regarding the 'mind's eye' and the 'images' which it sees. . . . . This points to some initial fallacy. . . . . It is only by a figure of speech that I can describe my recollection of a scene as a 'mental image' which I can 'see' with my 'mind's eye'. . . . . I do not see it . . . any more than a man sees the thousand lines of Sophocles which under due pressure he is ready to repeat. The memory possesses it, &c."

Much the same result followed some inquiries made for me by a friend among members of the French Institute.

On the other hand, when I spoke to persons whom I met in general society, I found an entirely different disposition to prevail. Many men and a yet larger number of women, and many boys and girls, declared that they habitually saw mental imagery, and that it was perfectly distinct to them and full of colour.

The more I pressed and cross-questioned them, professing myself to be incredulous, the more obvious was the truth of their first assertions. They described their imagery in minute detail, and they spoke in a tone of surprise at my apparent hesitation in accepting what they said. I felt that I myself should have spoken exactly as they did if I had been describing a scene that lay before my eyes, in broad daylight, to a blind man who persisted in doubting the reality of vision. Reassured by this, I recommenced to inquire among scientific men, and soon found scattered instances of what I sought, though in by no means the same abundance as elsewhere. I then circulated my questions more generally among my friends, and so obtained the replies that are the main subject of this memoir. The replies were from persons of both sexes and of various ages, but I shall confine my remarks in this necessarily brief memoir to the experiences derived from the male sex alone.

I have also received batches of answers from various educational establishments, and shall here make use of those sent by the Science Master of the Charterhouse, Mr. W. H. Poole, which he obtained from all the boys who attended his classes, after fully explaining the meaning of the questions, and interesting the boys in them. They have the merit of returns derived from a general census, which my other data lack, because I cannot for a moment suppose that the writers of them are a haphazard proportion of those to whom they were sent. Indeed, I know some men who, disavowing all possession of the power, cared to send no returns at all, and many more who possessed it in too faint a degree to enable them to express what their experiences really were, in a manner satisfactory to themselves. Considerable similarity in the general style of the replies will however be observed between the two sets of returns, and I may add that they accord in this respect with the oral information I have elsewhere obtained. The conformity of replies from so many different sources, the fact of their apparent trustworthiness being on the whole much increased by cross-examination (though I could give one or two amusing instances of break-down), and the evident effort made to give accurate answers, have convinced me that it is a much easier matter than I had anticipated to obtain trustworthy replies to psychological questions. Many persons, especially women and intelligent children, take pleasure in introspection, and strive their very best to explain their mental processes. I think that a delight in self-dissection must be a strong ingredient in the pleasure that many are said to take in confessing themselves to priests.

Here then are two rather notable results: the one is the proved facility of obtaining statistical insight into the processes of other

persons' minds; and the other is that scientific men as a class have feeble powers of visual representation. There is no doubt whatever on the latter point, however it may be accounted for. My own conclusion is, that an over-readiness to perceive clear mental pictures is antagonistic to the acquirement of habits of highly generalised and abstract thought, and that if the faculty of producing them was ever possessed by men who think hard, it is very apt to be lost by disuse. The highest minds are probably those in which it is not lost, but subordinated, and is ready for use on suitable occasions. I am however bound to say, that the missing faculty seems to be replaced so serviceably by other modes of conception, chiefly I believe connected with the motor sense, that men who declare themselves entirely deficient in the power of seeing mental pictures can nevertheless give life-like descriptions of what they have seen, and can otherwise express themselves as if they were gifted with a vivid visual imagination. They can also become painters of the rank of Royal Academicians.

The facts I am now about to relate, are obtained from the returns of 100 adult men, of whom 19 are Fellows of the Royal Society, mostly of very high repute, and at least twice, and I think I may say three times, as many more are persons of distinction in various kinds of intellectual work. As already remarked, these returns taken by themselves, do not profess to be of service in a *general* statistical sense, but they are of much importance in showing how men of exceptional accuracy express themselves when they are speaking of mental imagery. They also testify to the variety of experiences to be met with in a moderately large circle. I will begin by giving a few cases of the highest, of the medium, and of the lowest order of the faculty of visualising. The hundred returns were first classified according to the order of the faculty, as judged from the whole of what was said in them, and all I knew from other sources of the writers; and the number prefixed to each quotation shows its place in the class-list.

Vividness of Mental Imagery.

(From returns furnished by 100 men, at least half of whom are distinguished in science or in other fields of intellectual work.)

Cases where the faculty is very high.

1. Brilliant, distinct, never blotchy.

2. Quite comparable to the real object. I feel as though I was dazzled, *e.g.*, when recalling the sun to my mental vision.

3. In some instances quite as bright as an actual scene.

4. Brightness as in the actual scene.

5. Thinking of the breakfast table this morning, all the objects in my mental picture are as bright as the actual scene.

6. The image once seen is perfectly clear and bright.
7. Brightness at first quite comparable to actual scene.
8. The mental image appears to correspond in all respects with reality. I think it is as clear as the actual scene.
9. The brightness is perfectly comparable to that of the real scene.
10. I think the illumination of the imaginary image is nearly equal to that of the real one.
11. All clear and bright; all the objects seem to me well defined at the same time.
12. I can see my breakfast table or any equally familiar thing with my mind's eye, quite as well in all particulars as I can do if the reality is before me.

Cases where the faculty is mediocre.

46. Fairly clear and not incomparable in illumination with that of the real scene, especially when I first catch it. Apt to become fainter when more particularly attended to.
47. Fairly clear, not quite comparable to that of the actual scene. Some objects are more sharply defined than others, the more familiar objects coming more distinctly in my mind.
48. Fairly clear as a general image; details rather misty.
49. Fairly clear, but not equal to the scene. Defined, but not sharply; not all seen with equal clearness.
50. Fairly clear. Brightness probably at least one-half to two-thirds of original. [The writer is a physiologist.] Definition varies very much, one or two objects being much more distinct than the others, but the latter come out clearly if attention be paid to them.
51. Image of my breakfast table fairly clear, but not quite so bright as the reality. Altogether it is pretty well defined; the part where I sit and its surroundings are pretty well so.
52. Fairly clear, but brightness not comparable to that of the actual scene. The objects are sharply defined; some of them are salient, and others insignificant and dim, but by separate efforts I can take a visualised inventory of the whole table.
53. Details of breakfast table *when the scene is reflected on*, are fairly defined and complete, but I have had a familiarity of many years with my own breakfast table, and the above would not be the case with a table seen casually unless there were some striking peculiarity in it.
54. I can recall any single object or group of objects, but not the whole table at once. The things recalled are generally clearly defined. Our table is a long one; I can in my mind pass my eyes all down the table and see the different things distinctly, but not the whole table at once.

Cases where the faculty is at the lowest.

89. Dim and indistinct, yet I can give an account of this morning's breakfast table;—split herrings, broiled chickens, bacon, rolls, rather light coloured marmalade, faint green plates with stiff pink flowers, the girls' dresses, &c., &c. I can also tell where all the dishes were, and where the people sat (I was on a visit). But my imagination is seldom pictorial except between sleeping and waking, when I sometimes see rather vivid forms.
90. Dim and not comparable in brightness to the real scene. Badly defined with blotches of light; very incomplete.
91. Dim, poor definition; could not sketch from it. I have a difficulty in seeing two images together.
92. Usually very dim. I cannot speak of its brightness, but only of its faintness. Not well defined and very incomplete.

93. Dim, imperfect.

94. I am very rarely able to recall any object whatever with any sort of distinctness. Very occasionally an object or image will recall itself, but even then it is more like a generalised image than an individual image. I seem to be almost destitute of visualising power, as under control.

95. No power of visualising. Between sleeping and waking, in illness and in health, with eyes closed, some remarkable scenes have occasionally presented themselves, but I cannot recall them when awake with eyes open, and by daylight, or under any circumstances whatever when a copy could be made of them on paper. I have drawn both men and places many days or weeks after seeing them, but it was by an effort of memory acting on study at the time, and assisted by trial and error on the paper or canvas, whether in black, yellow or colour, afterwards.

96. It is only as a figure of speech that I can describe my recollection of a scene as a 'mental image' which I can 'see' with my 'mind's eye.' . . The memory possesses it, and the mind can at will roam over the whole, or study minutely any part.

97. No individual objects, only a general idea of a very uncertain kind.

98. No. My memory is not of the nature of a spontaneous vision, though I remember well where a word occurs in a page, how furniture looks in a room, &c. The ideas are not felt to be mental pictures, but rather the symbols of facts.

99. Extremely dim. The impressions are in all respects so dim, vague and transient, that I doubt whether they can reasonably be called images. They are incomparably less than those of dreams.

100. My powers are zero. To my consciousness there is almost no association of memory with objective visual impressions. I recollect the breakfast table, but do not see it.

These quotations clearly show the great variety of natural powers of visual representation. I will proceed to examine the subject more closely, and to compare the returns from the 100 men with those from the Charterhouse boys, on the principle of my "Statistics by Intercomparison," which I must first explain at sufficient length.

There are many who deny to statistics the title of a science, and say that it is a mere collection of facts. For my part I think that there is such a thing as a science of statistics, though its field is narrowed almost to a point. Its object is to *discover methods* of epitomising a great, even an infinite, amount of variation in a compact form. To fix the ideas, it is well to take as an example the heights of men, in which case the science of statistics enables us to specify, by means of a very few figures, the conditions of stature that characterise the whole of the adult male inhabitants, say of the British Isles. These figures will suffice to inform us that there are so many per cent. between such and such heights, and so many between such other heights, giving us material whence we can answer any such question as this:—Out of 1000 men how many are we likely to find between 5 feet and 6 feet in height? If the figures do not give the answer directly, we can find it by interpolation and easy calculation from them. So again, if we wish to compare the heights of

Englishmen and Frenchmen, statistics show how to obtain the average height of the two races, and the two averages may be readily compared, which goes a considerable way towards answering the question; or, if we wish it, we may compare very much more in detail, all the facts that are needed for the purpose being contained in the few figures of which I spoke.

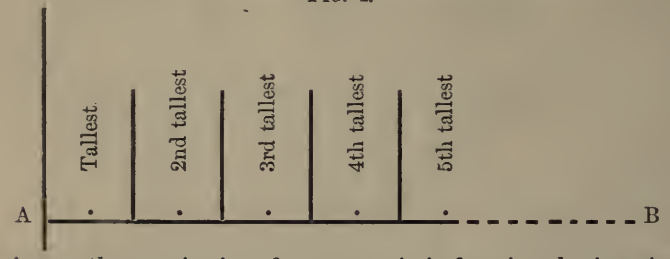
But all these operations require the use of an *external standard*. The men must be separately measured by a foot-rule before their measurements can be classified, and the same need of an external standard of measurement is felt in every case with which the ordinary methods of statistics profess to deal. The standard of measurement may be that of time, weight, length, price, temperature, &c., but without the almanack or watch, the scales, the foot-rule, the coin, the thermometer, &c., statistics of the ordinary form to which I refer, cannot be made.

In my process, there is no necessity for an external standard. It clearly comes to the same thing whether I take eleven men and, measuring them one against another, range them in order, beginning with the highest and ending with the lowest, or if I measure them separately with a foot-measure, and range them in the order of the magnitude of the measurements recorded in my note-book. In each case the tallest man will stand first, the next tallest second, and so on to the last. In each case the same man will occupy the sixth or *middlemost* place, and will therefore represent the *medium* height of the whole of them. I do not wish to imply that 'medium' is identical with 'mean' or 'average,' for it is not necessarily so. But I do say that the word medium may be strictly defined, and therefore if we wish to compare the heights of Englishmen with Frenchmen, we shall proceed just as scientifically if we compare their medium heights as if we compare their average heights. Now it will be observed that we have got the medium heights without a foot-rule or any external standard; we have done so altogether by the method of intercomparison. In the particular question with which we are dealing I have classified the answers according to the degree of vividness of mental imagery to which they depose, and I pick out the middlemost answer and say that the description given in it describes the medium vividness of mental imagery in the group under discussion. If I want to compare two such groups I compare their respective middlemost answers, and judge which of the two implies the higher faculty.

Thus much is a great gain, yet I claim to effect more; but in order to explain what that is I must return to the illustration of heights of men. Suppose them as before to be all arranged in order of their stature, at equal distances apart on a long line A B, with their backs turned towards us. If there

be a thousand men, we must suppose A B to be divided into 1000 equal parts, and a man to be set in the middle of each part. The tallest man will have A close to his left, and the shortest man will have B close to his right. They will form a series as shewn in Fig. I., where the subdivisions of A B are indicated by the vertical lines, and the positions where the men are standing are shown by the dots half-way between those lines.

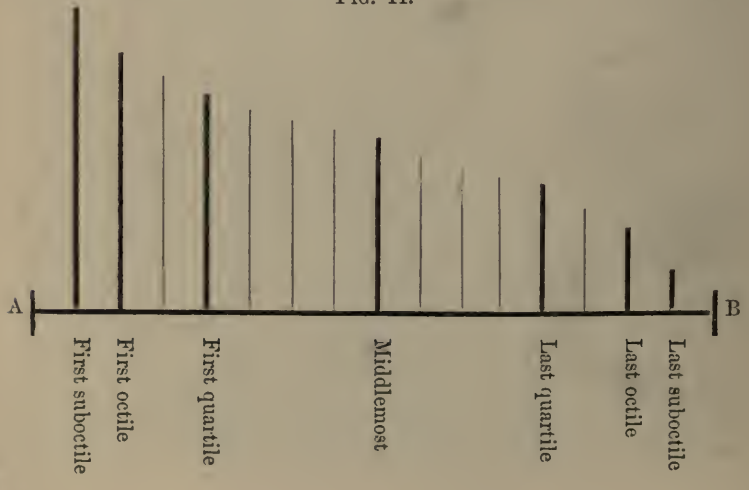
FIG. I.



Owing to the continuity of every statistical series, the imaginary line drawn along the tops of the heads of the men will form a regular curve, and if we can record this curve we shall be furnished with data whereby to ascertain the height of every man in the whole series. Drawing such a curve for Englishmen and another for Frenchmen, and superimposing the two, we should be able to compare the statures of the two nations in the minutest particulars.

A curve is recorded by measuring its ordinates. If we divide A B by a sufficient number of equi-distant subdivisions and measure the ordinates at each of them as has been done in Fig.

FIG. II.



II. (where the ordinates only are shewn, and not the curve), we can at any time plot them to scale, and by tracing a free line touching their tops, we can with more or less precision, reproduce the curve. It happens, however, from the peculiar character of all statistical curves, that ordinates at equal distances apart are by no means the most suitable. The mediocre cases are always so numerous that the curve flows in a steady and almost straight line about its middle, and it becomes a waste of effort to take many measurements thereabouts. On the other hand its shape varies rapidly at either end, and there the observations ought to be numerous. The most suitable stations are those which correspond to ordinates that differ in height by *equal degrees*, and these places admit of being discovered by *à priori* considerations on certain general suppositions.[1]

We shall however do well to ignore those minutiæ on which I laid much stress in the Memoir, and adopt the simpler plan of successive subdivisions of A B, and of measuring the ordinates shown by darkened lines in Fig. II., and severally named there as 'middlemost,' first and last 'quartile,' first and last 'octile,' and first and last 'suboctile'. This is far enough for our present wants, though the system admits of indefinite extension. By measuring the 'ordinate,' I mean measuring the 'man' whose place in the series is nearest to the true position of that ordinate. Absolute coincidence is not needed in such rude work as this; thus in a series of 100 men either the 50th or the 51st will do duty for the middlemost. The places I have actually taken in the series of 100 men for the several stations, are, the 6th and 94th for the first and last suboctiles, the 12th and 88th for the octiles, the 25th and 75th for the quartiles, and the 50th for the middlemost.

Seven men thus become the efficient representatives of a very large class. It will be found as a general rule that these seven selected representatives will differ each from the next by approximately *equal intervals*, the difference between the suboctile and the octile being usually about the same as that between the octile and quartile, and between the quartile and the middlemost.

[1] These are discussed in the Memoir already referred to, "Statistics by Intercomparison," by myself, in *Phil. Mag.*, Jan., 1875, but there are some errors, and also some appearances of error owing to faults of expression, in that article, which were first pointed out to me by Mr. J. W. L. Glaisher. There is a full mathematical discussion bearing on the matter in a memoir by Mr. D. McAlister in the *Proceedings of the Royal Society*, 1879, on the "Law of the Geometric Mean," to which and to the immediately preceding paper by myself on the "Geometric Mean," I would refer the mathematical reader. Mr. J. W. L. Glaisher has also taken the subject in hand and calculated tables, and I trust that his memoir thereon may before long be published.

As a matter of interest, and for the chance of finding very exceptional cases, I also record the highest and the lowest of the series, but it must be clearly understood that these have no solid value for purposes of comparison. In the first place, their position as ordinates is uncertain unless the number of the group of cases is given, for when the number is large the position of the highest and lowest will be nearer to A and B respectively than when it is small. In the second place, the highest and lowest being outside cases, they are more liable to be of an exceptional character than any of those which stand between neighbours, one on either hand of it.

The comparison of any two groups is made by collating their seven representatives each to each, the first suboctile of the one with the first suboctile of the other, the first octile with the first octile, the first quartile with the first quartile, and so on. I also collate the highest of each, and again the lowest of each, as a mere matter of interest, but not as an accurate statistical operation, for the reasons already given.

It is possible that I may be thought to have somewhat loosely expressed myself under the necessity of foregoing the use of technical terms, but the mathematical reader who demands precision of statement will understand me, while it would require a treatise and much study to make the mathematical substratum of my method perfectly intelligible to a person who was not familiar with the laws of 'Probabilities' and 'Frequency of Error'.

In the following comparison between the 100 Adult Englishmen and the 172 Charterhouse boys, I have divided the latter into two groups, to serve as a check upon one another. Group A includes boys of the four upper classes in the school, group B those of the five lower classes. I have combined their replies as to Illumination and Definition under the single head of 'Vividness,' and have taken no editorial liberties whatever except of the most pardonable description. It is wonderful how well and graphically the boys write, and how much individual character is shown in their answers.

Vividness of Imagery.

HIGHEST.

Adult Males.—Brilliant, distinct, never blotchy.

Charterhouse A.—The image is perfectly clear. I can see every feature in every one's face and everything on the table with great clearness. The light is quite as bright as reality.

Charterhouse B.—The image that arises in my mind is perfectly clear. The brightness is decidedly comparable to that of the real scene, for I can see in my mind's eye just as well as if I was beholding the scene with my real eye.

FIRST SUBOCTILE.

Adult Males.—The image once seen is perfectly clear and bright.

Charterhouse A.—It is very clear and is as bright as it actually was. Everything occurs most distinctly. I can imagine everything at once, but can think a great deal more clearly by thinking more on a particular object.

Charterhouse B.—I see it exactly as it was, all clearly defined just as it was.

FIRST OCTILE.

Adult Males.—I can see my breakfast table or any equally familiar thing with my mind's eye quite as well in all particulars as I can do if the reality is before me.

Charterhouse A.—To me the picture seems quite clear and the brightness equal to the real scene. I cannot see the whole scene at the same instant, but I see one thing at once and can turn my eye mentally to another object very quickly, so that I soon get the whole scene before my mind.

Charterhouse B.—Fairly clear. I cannot see everything at the same time, but what I do see seems almost real.

FIRST QUARTILE.

Adult Males.—Fairly clear; illumination of actual scene is fairly represented. Well defined. Parts do not obtrude themselves, but attention has to be directed to different points in succession to call up the whole.

Charterhouse A.—The image is fairly clear, but its brightness is dimmer than the actual. The objects are mostly defined clearly and at the same time.

Charterhouse B.—Fairly clear, the objects are pretty well defined at the same time.

MIDDLEMOST.

Adult Males.—Fairly clear. Brightness probably at least from one-half to two-thirds of the original. Definition varies very much, one or two objects being much more distinct than the others, but the latter come out clearly if attention be paid to them.

Charterhouse A.—The image is fairly clear, but its brightness is not comparable to that of the actual scene. The objects are pretty well defined at the same time.

Charterhouse B.—The image is pretty clear, but not so clear as the actual thing. I cannot take in the whole table at once, and I cannot see more than three plates at once, and when I try to see both ends of the table I cannot see anything of the middle. I can see nothing beyond the table, but the table itself seems to stand out from the distance beyond.

LAST QUARTILE.

Adult Males.—Dim, certainly not comparable to the actual scene. I have to think separately of the several things on the table to bring them clearly before the mind's eye, and when I think of some things the others fade away in confusion.

Charterhouse A.—The image is fairly clear. I cannot see everything at once, but as I think of them they come clearly before me. The objects are not all defined at the same time, and the place of sharpest definition is more contracted than in real scene.

Charterhouse B.—If I think of any particular thing without the others, it seems clear; all at once, are not clear.

LAST OCTILE.

Adult Males.—Dim and not comparable in brightness to the real scene.

Badly defined with blotches of light; very incomplete; very little of one object is seen at one time.

Charterhouse A.—I can call up to my mind the picture of the breakfast table in every detail, but seem to see everything through a darkened pane of glass. I see just the same number of people, plates, &c., the whole time, provided of course that I do not change my idea of the scene to any great degree.

Charterhouse B.—Rather dim; the objects are pretty well defined.

LAST SUBOCTILE.

Adult Males.—I am very rarely able to recall any object whatever with any sort of distinctness. Very occasionally an object or image will recall itself, but even then it is more like a generalised image than an individual one. I seem to be almost destitute of visualising power as under control.

Charterhouse A.—The image is dim, dark, and smaller than the actual scene, and the objects nearest to me show most distinctly. The whole picture is more or less of a dark green tint.

Charterhouse B.—Dim. The place of sharpest definition is more contracted than in a real scene.

LOWEST.

Adult Males.—My powers are zero. To my consciousness there is almost no association of memory with objective visual impressions. I recollect the table, but do not see it.

Charterhouse A.—Image dim, the brightness much less than in the real scene. Only one object is very clearly visible at the same time.

Charterhouse B.—Very dim. I can only see one part at a time.

I gather from the foregoing paragraphs that the A and B boys are alike in mental imagery, and that the adult males are not very dissimilar to them; but the latter do not seem to form so regular a series as the boys. They are avowedly not members of a true statistical group, being an aggregate of one class of persons who replied because they had remarkable powers of imagery and had much to say, of another class of persons, the scientific, who on the whole are very deficient in that gift, and of a third class who may justly be considered as fair samples of adult males.

I next proceed to colour, and annex the returns to the third of the above questions, which I have classified on the same principle as before.

Colour Representation.

HIGHEST.

Adult Males.—Perfectly distinct, bright, and natural.

Charterhouse A.—Yes, *perfectly* distinct and natural.

Charterhouse B.—The colours look more clear than they really are.

FIRST SUBOCTILE.

Adult Males.—White cloth, blue china, argand coffee pot, buff stand with sienna drawing, toast,—all clear.

Charterhouse A.—I see the colours just as if they were before me, and perfectly natural.

Charterhouse B.—The colours are especially distinct in every case.

FIRST OCTILE.
Adult Males.—All details seen perfectly.
Charterhouse A.—Quite distinct and natural.
Charterhouse B.—All colours are perfectly distinct to me in my mind's eye, in whatever scene or shape they appear to me.

FIRST QUARTILE.
Adult Males.—Colours distinct and natural till I begin to puzzle over them.
Charterhouse A.—Quite distinct and natural.
Charterhouse B.—The colours of the china, &c., are quite distinct and natural.

MIDDLEMOST.
Adult Males.—Fairly distinct, though not certain that they are accurately recalled.
Charterhouse A.—They are all distinct after a little thought, and are natural.
Charterhouse B.—Yes, quite distinct and natural.

LAST QUARTILE.
Adult Males.—Natural, but very indistinct.
Charterhouse A.—The colours of the most pronounced things on the table are distinct, as the white tablecloth and yellow mustard.
Charterhouse B.—Some are; china, mustard, toast,—the others are not.

LAST OCTILE.
Adult Males.—Faint, can only recall colours by a special effort for each.
Charterhouse A.—Colours not very distinct.
Charterhouse B.—They are natural, but not very distinct.

LAST SUBOCTILE.
Adult Males.—(Power is nil.)
Charterhouse A.—The colours are very dim.
Charterhouse B.—The colours seem to be more like shades, but they have some colour in them.

LOWEST.
Adult Males.—(Power is nil.)
Charterhouse A.—(Power is nil.)
Charterhouse B.—(Power is nil.)

The same general remarks may be made about the distribution of the faculty of colour representation as about that of the vividness of imagery. It seems that on the whole, colour is more easily recalled than form, and especially so by the young. As the faculty of visual representation is being dropped by disuse, colour disappears earlier than form. This I may remark, was the case with the often quoted hallucinations of Nicolai, which, in his progress to recovery, faded in colour before they faded in outline.

One of my correspondents, an eminent engineer, who has a highly developed power of recalling form, but who described himself as deficient in the power of recalling colour, tells me that since receiving and answering my questions he has prac-

tised himself in visualising colours and has succeeded perfectly in doing so. It now gives him great pleasure to recall them.

It will be of interest to extract the few instances from the returns of the Adult Males in which peculiarities were noticed in connexion with colour representation, other than in its degree of vividness. Each sentence is taken from a different return.

Light colours quite distinct, darker ones less so.
Patchy.
Generally hueless, unless excited.
Mostly neutral.
Brown colour, *e.g.* of the gravy, is difficult to visualise.

Another question that I put was as follows :—

"*Extent of field of view.*—Call up the image of some panoramic view (the walls of your room might suffice); can you force yourself to see mentally a wider range of it than could be taken in by any single glance of the eyes? Can you mentally see more than three faces of a die, or more than one hemisphere of a globe at the same instant of time?"

It would have been possible to classify the Charterhouse returns, but the answers were not so generally good as to make it advisable to spend pains upon them. I therefore content myself with the replies of the Adult Males, but shall subsequently add a few facts taken from those of the boys, in a separate paragraph.

Extent of Field of Mental View.

Highest.—My mental field of vision is larger than the normal one. In the former I appear to see everything from some commanding point of view, which at once embraces every object and all sides of every object.

First Suboctile.—A wider range. A faint perception *I think* of more than three sides of a room. Rather more *I think* than one hemisphere, but am not quite sure about this.

First Octile.—Field of view corresponding to reality.

First Quartile.—Field of view corresponding to reality.

Middlemost.—Field of view corresponding to reality.

Last Quartile.—I think the field of view is distinctly smaller than the reality. The object I picture starts out distinct with a hazy outline.

Last Octile.—Much smaller than the real. I seem only to see what is straight in front as it were.

Last Suboctile. } No field of view at all.
Lowest. }

It may seem strange to some that the field of mental vision should occasionally be wider than reality, but I have sufficient

testimony to the fact from correspondents of unquestionable accuracy. Here are cases from the returns:—

I seem to see the whole room as though my eye was everywhere. I can see all around objects that I have handled.

I can see three walls of a room easily, and with an effort the fourth. I can see all the faces of a die and the whole globe, but die and globe seem transparent.

[An eminent mineralogist told me that familiarity with crystals gave him the power of mentally seeing all their facets simultaneously.]

This subject is of interest to myself on account of a weird nightmare by which I am occasionally plagued. In my dream, a small ball appears inside my eye. I speak in the singular, because the two eyes then seem fused into a single organ of vision, and I see by a kind of touch-sight all round the ball at once. Then the ball grows, and still my vision embraces the whole of it; it continues growing to an enormous size, and at the instant when the brain is ready to burst, I awake in a fright. Now, what I see in an occasional nightmare, others may be able to represent to themselves when awake and in health.

From the foregoing statistical record it will be seen that in one quarter of the cases, that is to say, in the last quartile and in all below, the field of mental view is decidedly contracted. The Charterhouse returns (A and B combined) give a higher ratio. They show that in at least 74 out of the 172 cases, or in 43 per cent. of them, it is so; indeed, the ratio may be much larger, as I hardly know what to say about 51 cases, owing to insufficient description. I am inclined to believe that habits of thought render the mental field of view more *comprehensive* in the man than in the boy, though at the same time it causes the images contained in it to become fainter.

A few of the boys' answers are much to the point. I append some of them:—

The part I look at is much smaller than reality, with a haze of black all round it. It is like a small picture.

I have to fix my eyes on one spot in my imagination, and that alone is fairly defined.

I cannot see anything unless I look specially at it, which is not the case with my real eyes.

I have to move my mental eyes a good deal about. The objects are not defined at the same time, but I think of them one at a time; also, if I am thinking of anything, as a map for instance, I can only imagine one name at a time.

The next question that I put referred to the apparent position of the image. It was as follows:—

"*Distance of images.*—Where do mental images appear to be situated? within the head, within the eye-ball, just in front of

the eyes, or at a distance corresponding to reality? Can you project an image upon a piece of paper?"

Unfortunately this question was not included among those that I first issued, and I have not a sufficient number of answers to it from adult males to justify a statistical dependence on them even on that ground alone. It is better in this case to rely on the Charterhouse boys, of whom only twelve failed to answer the question. Reducing to percentages, I find:—

POSITION OF MENTAL IMAGES.

	Per Cent.
Further than the real scene	9
Corresponding to reality	39
Just in front of the eyes	22
In eye-ball	6
In head	15
Partly at one distance, partly at another	9
	100

The more closely the image resembles in its vividness the result of actual vision the more nearly should we expect its distance to appear to coincide with that of the real object, and this as a matter of fact I find to be the case. The meaning of the word *reflection* is bending backwards, and those who reflect have the sense of a turning back from without to within the head. When a mental scene arises vividly and without any effort, the position of the vision is more frequently external, as it is in an hallucination.

I will next give the results of the latter part of the question, about the ability to project images on paper.

For the same reason as in the last case the returns from the adult males are insufficient. I have five clear cases only among them of an affirmative answer, out of which I will quote the following:—

ABILITY TO PROJECT AN IMAGE.

Holding a blank piece of paper in my hand, I can imagine on it a photograph or any object that it will hold.

The Charterhouse boys in at least 18 cases, or in ten per cent. of them, appear to have this power. The following are a few of their answers:—

I can think things to be upon a blank piece of paper.

I can place a mental image wherever I like, outside the head, either in the air or upon any substance.

After looking at a blank wall for some time, I can imagine what I am thinking of.

I can half project an image upon paper, but could not draw round it, it being too indistinct. I see the effect, but not the details of it.

I find it very hard to project an image on a piece of paper, but if I think for some time and look very hard at the paper, I sometimes can.

I can project an image on to anything, but the longer I keep it the fainter it gets, and I don't think I could keep it long enough to trace it.

I find indirectly from the answers to other questions that visual representations are by no means invariably of the same apparent size as the real objects. The change is usually on the side of reduction, not of enlargement. Among the Charterhouse boys there are thirteen of the one to two cases of the other, and I think, but I have not yet properly worked it out, that the returns from adults generally, male and female, show somewhat similar results. The following are extracts from the reports of the boys:—

Images Larger than Reality.

The place and objects in a mental picture seem to be larger altogether than the reality; thus a room seems loftier and broader, and the objects in it taller.

They look larger than the objects [? such objects as may be handled] really are, and seem much further off, . . they look about five yards off.

Images Smaller than Reality.

Very small and close.

Much smaller and very far off.

All the objects are clearly defined, but the image appears much smaller.

The difference that I see is, that everything I call up in my mind seems to be a long way off.

The difference is that it is much smaller.

Space does not admit, neither is this the most suitable opportunity of analysing more of the numerous data which I have in hand, but before concluding I would say a few words on the "Visualised Numerals" which I described first in *Nature*, Jan. 15, 1880, but very much more fully and advisedly in a memoir read before the Anthropological Institute in March, 1880, which will be published in its *Transactions* a few weeks later than the present memoir. It will contain not only my own memoir and numerous illustrations, but the remarks made on it at the meeting by gentlemen who had this curious habit of invariably associating numbers with definite forms of mental imagery. It is a habit that is quite automatic, the form is frequently very vivid and sometimes very elaborate and highly coloured, and its origin is always earlier than those who see it can recollect. Those who visualise numerals in number-forms are apt to see the letters of the alphabet, the months of the year, dates, &c., also in forms; but whereas they nearly always can suggest some clue to the origin of the latter, they never can, or

hardly ever can, to that of the numerals. I have argued in the memoir just mentioned, partly from this fact and partly because some of the number-forms twist and plunge and run out of sight in the strangest ways, unlike anything the child has ever seen, that these are his natural, self-developed lines of mnemonic thought, and are survivals of the earliest of his mental processes, and a clue to much that is individual in the constitution of his mind. I found that only about one in thirty adult males saw these forms, but suspected that they were more common in early life, and subsequently lost by disuse. This idea is abundantly confirmed by the returns of the Charterhouse boys. Nearly one in four has the habit of referring numbers to some visual mental form or other; often it is only a straight line, sometimes more elaborate. No doubt as the years go by, most of these will be wholly forgotten as useless and even cumbrous, but the rest will serve some useful turn in arithmetic and become fixed by long habit, and will gradually and insensibly develop themselves. For want of space I must here close my statement of facts; and, my data being thus imperfectly before the reader, it would be premature in me to generalise. I trust, however, that what has been adduced is enough to give a fair knowledge of the variability of the visualising faculty in the English male sex, and I hope that the examples of the use of my "Statistics by Intercomparison" will convince psychologists that the relative development of various mental qualities in different races admits of being pretty accurately defined.

FRANCIS GALTON.

II.—THE UNITY OF THE ORGANIC INDIVIDUAL.

I.

IN the free exercise of our thought and volition, we would laugh to scorn the intimation that not in our own undivided personality are lodged these sovereign powers, but that they originate outside of it, dispersedly, within the diminutive lives of a vast number of microscopical threads and dots. We would resign our autonomy to the five or six billions of corpuscles composing our bodies, upon no other conditions than such as have convinced us that, in spite of all appearances to the contrary, the earth is moving round the sun. It constitutes the loftiest pride of our culture to abnegate subjective impressions in favour of the demonstrations of science. We know, therefore, how we shall have to deport ourselves in the presence of facts, if they visibly confront and obstinately oppose our feeling

of centralised personality. The histologist spreads before us a shred of brain and a shred of muscle, and apparently there is nothing there but fibres and corpuscles. "These are the neural elements that compose your nervous system, these the contractile elements that make up your motor organs. It is they that feel and think, that move and overcome resistances. What you call the consciousness of your personality is nothing but a resultant of the activities of myriads of such separate beings, of which your so-called body is a mere aggregate." This way of looking at things, commonly adopted by men of science, cannot be ignored by philosophers, for it leads inexorably to certain definite philosophical conclusions. It admits of no compromise. If it is true, psychology will have unreservedly to bend to its bearings; and this is my plea for laying before a philosophical audience the somewhat biological contents of these pages. If sensations are in truth compounded from the data furnished by individual and elementary cells, then psychological results must inevitably be realised in a sphere transcending vitality. Our organisation will be nothing but an elaborate mechanical apparatus through which mysterious outside powers are keeping up a telegraphic communication with a realm of pure spirituality, and through which this spiritual realm reacts mechanically on the outside powers. To be logically driven to such a conclusion would be indeed a strange fate for a generation that takes both life and science seriously.

The Cell-theorists exult in the idea that so many billions of separate beings are, unconsciously and nevertheless with rigorous precision, shaping and actuating the marvellous mechanism of our complex life. They do not perceive that their fancied configuration of elementary units would necessitate a complex system of supernaturally pre-arranged harmonies, compared to which the moving and harmonising contrivances of the 'Monadology' would appear simple and natural. It is rather humiliating for biologists to find out at the end that all their strenuous efforts to bring the phenomena of life within the sphere of physical and chemical explanation have only resulted in a most emphatic and powerful confirmation of metaphysical doctrines.

How was it possible for so many vigilant inquirers to persist in overlooking the necessary philosophical implications of their fundamental doctrine? No lack of serious and well-directed philosophical thought can be imputed to the foremost representatives of natural science. On the contrary, never before have its votaries been more earnestly striving to gain an understanding, not only of detached occurrences, but also of the general interdependence of natural phenomena. But never before, also, has the task of generalising been so utterly perplexing as just

now. On the one hand, the growing consciousness of the ultimate mental consistency of all experience is rendering more and more suspicious and unsatisfactory the plain and definite tenets of the corpuscular theory of matter, tenets that have hitherto afforded so firm and safe a basis, at least for physical and chemical research. On the other hand, the extensive groundwork of verified and irrepressible facts, composing our scientific knowledge, makes it quite impracticable for impatient systematisers to palm upon us a view of things in any way incongruous with this imposing array of ascertained experience. The easy time is for ever past when natural events had merely to be explained so as approximately to fit a given system. We now find ourselves burdened with the harder task of having to construct a system that will accurately fit the natural events. There is placed before our minds a rich medley of seemingly disparate and yet somehow intimately interlacing facts ; and now we wish to know how this scientific miscellany is to be conceived as the one consistent and uncontradictory whole which it unmistakably constitutes. Strict regularity is discovered wherever exact investigation penetrates, and yet however much we may be striving to reach a comprehensive view of nature, our bewildered understanding fails in the attempt; not, indeed, as might be supposed, because of the many gaps in our knowledge, but because of the irreconcilable contrasts in it.

All our numbering, weighing, measuring, and classifying does not suffice to lay effective hold on objects. We set out with the impression of having matter before us, and end with the conviction that it is all force ; force not a twin-manifestation of materiality, keeping equal pace with it, but force encroaching on the very essence of matter, till nothing substantial is left. Force, then, under this aspect, would seem to disclose itself as the true reality, underlying material appearances. But as soon as we endeavour to seize upon it for close inspection, it evades our grasp, losing itself completely in its effects—transformed into something new and strange. It needs, indeed, only an eye keen enough to pierce beyond the veil of phenomenal repose to see it figured by the wildest imaginable phantasmagoria.

But however profound our diffidence may have become with regard to the ultimate consistency of existence, we are undoubtedly in possession of a stupendous stock of scientific truths gathered from the minute investigation of inorganic nature. Thus prepared and equipped, we approach the mystery of the organic world. We discover the very transition of the inorganic into the organic—the actual formation of organic compounds out of inorganic elements, and we trace a progressive series of synthetical products from the lowest to the highest

organic substance. We cannot doubt that organic nature is the evolutional outgrowth of inorganic nature, and that the most complex organic product has been gradually elaborated from less complex compounds. But suddenly, amid this apparently satisfactory view of things, we are reminded of Berkeley's fundamental maxim—"To be is to be perceived"; and we realise the incontrovertible truth that the organism cannot possibly be the mere product of its inorganic factors, nor these inorganic factors themselves what they seemed to be, for their very nature and existence is conditioned by the perceiving mind which looks out from the organism that just before was considered to result simply from their own material combination and dynamical co-operation.

Thus in our progress from inorganic to organic nature, the scientific puzzle becomes still more tangled and diversified. If, on the one side, the material constituting organisms and the forces actuating this material are exclusively derived from inorganic sources, then animate existence is certainly altogether dependent on inanimate existence. If, on the other side, it is the specific vital activity of animate existences which endows inanimate existences with every one of their discernible qualities—which, indeed, renders them at all sensible realities, then surely lifeless nature is altogether dependent on living nature. The dilemma is inevitable. The consciousness of it now forms part of every thoughtful mind, haunting the certitude of first principles, and threatening with dissolution the entire subsistence of material as well as ideal reality.

We have to make clear to ourselves that it is a perfectly legitimate biological inference which has increased our scientific perplexity to such an alarming and overwhelming extent. It is our growing insight into vital activity that has dissipated objective as well as subjective substantiality. Modern scepticism is the unmitigated expression of a physiological fact. It is evident beyond dispute that the influences stimulating our organs of sense cannot possibly bear the least resemblance to the perceptions which they rouse in the brain, and which manifest themselves there organically, by dint of its own inherent vital powers and in conformity with its own indwelling vital laws. It was through the direct investigation of the biological phenomena of vision that Berkeley achieved his signal and decisive victory over hypostatical materiality. And it was at bottom also a physiological conception that led Hume to question the spontaneous efficacy of mind, and with it the innate inherence and necessary coherence of its ideas.

There remained then of the whole universe—unsustained by any material, mental, or spiritual support—the bare manifestation

of a more or less coherent series of impressions, actual and remembered, only an evanescent play of loosely-bound phenomena, emerging for momentary use from vacant nothingness. Is this not truly the gist of Nominalistic Idealism, the much-vaunted philosophy of our age—life abandoned by reason, and delivered over to blind nihilism?

Our thinking has, indeed, been caught in the giddy whirl of vitality, and now finds itself everywhere and nowhere at the same moment. The superficial contemplation of living activity has led it astray. The more profound contemplation of living activity will right it again.

It would seem as if Evolution contained a promise to life of fruitful toil, secured by enduring triumph and progressive power. But Evolution is as yet only empirically known in its general effects and collective workings. It is not scientifically intelligible as a power primordially directing life. The attempts at an application of the principles of Evolution to the fundamental properties of life have hitherto failed. It will presently be shown that neither Mr. Darwin's Pangenesis, nor Mr. Herbert Spencer's Polarigenesis, nor Haeckel's Perigenesis can stand the test of accurate inspection. The cell-theory is here everywhere in the way, creating impassable chasms between organic gradations which evolutionally ought to follow each other in unbroken sequence and continuity.

However, it is in this direction, I believe, that we have to seek for a firm anchorage for our Philosophy, now adrift on a fathomless sea, and for ever severed from its traditional moorings.

II.

The great generalisation that, at the present moment, has gained unrestricted sway in biological research, may be shortly expressed in the following terms:—

The complex organism is in reality an aggregate of morphologically distinguishable units. It is in these individual units that the fundamental properties of life are inherent, and the various activities manifested by the organism, as a whole, are resultants of the discrete activities of just so many of these autonomous elements as the organism is composed of.

It is clear that the biological inquirers, who accept this cell-theory as ultimate truth, or, at least, as a final foundation for their science, do not profess to concern themselves with the real mystery of life. Nutrition, growth and reproduction, heredity and adaptation, motility and sensibility, in fact all the properties essential to living beings, are by them already presupposed as original endowments of the morphological units.

Their task can only consist in showing how the living elements become associated and grouped so as to constitute a complex organism, and how, by their definite arrangement and co-operation, complicated functions are then performed. They keep in view, as far as possible, only the cycle of individual development, the ontogenetic circle, and are striving to establish within these limits a statical science, a science of definitely pre-established cell-multiplication and cell-association.

But, we may pertinently ask, is not the very emergence and maintenance of life essentially dynamical? And is not even its visible embodiment a veritable vortex, only phenomenally stable, but in reality receiving shape and constitution from an unremitting flow of molecular change?

This fashioning of the form of life by molecular processes is obviously the one fact that, above all others, has to be investigated, if we seriously desire to become initiated into the secret of life. We cannot accept the enigma of the cell as final. We are driven by the requirements of science to seek for an explanation of the primary properties of the living substance, nutrition, growth, reproduction, and all the rest.

The embryonic cell-structure, issuing from a single parent and resulting nevertheless in the strange diversity of tissues that compose the complex organism, is in itself an irrepressible plea for a strictly evolutional interpretation. It is perfectly legitimate to desire to know how vital properties, originally condensed within the compass of a single cell, become eventually unfolded, so as to be morphologically represented by specific tissues, occupying wide-spread regions of an organised commonwealth, composed of myriads of mere derivative daughter-cells. It would, indeed, be a triumph of biological insight, highly conducive to the formation of a real science of life, if we could possibly ascertain how the molecularly correlated energies of the initial morphological unit get so widely differentiated and dissevered, in the course of cell-multiplication, as ultimately to constitute the well-nigh exclusive properties of distinct groups of cells, the so-called tissues—muscular tissue ministering essentially to motility, nervous tissue to sensibility, the tissues of the entoderm to nutrition, and so on.

But there are vital changes that urge us still more peremptorily to inquire into the conditions that underlie organic plasticity and development. The variation of individual organisms from their generic type is a phenomenon that cannot evade our daily observation. Here the deviation and adaptation of vital forms and energies become immediately perceptible, and the scientific mind is impelled to account for such changes.

It is plain that if the shapes and functions of life are, indeed,

not immutably fixed, if, moreover, such variations as occur do not entirely depend on intrinsic powers, but are, on the contrary, also conditioned by external circumstances, then surely such modifying external influences can be exerted only on the ultimate constitution of the morphological units. The specific motions that make up the life of the elements are those that must be affected by the modifying process; for the life of the entire organism is avowedly only the resultant of the lives of its elements. We find ourselves, therefore, again compelled to penetrate beyond morphological appearances into the secret nature of the cell itself. In order to explain any change that may be effected in the organism by influences emanating from the medium, we must question the molecular processes through which the change is necessarily realised.

An hypothesis having for its foundation the absolute invariability of organisms, would be too strikingly at variance with most evident facts to have a chance of being propounded by anyone. On the other hand, the variation and development of organisms solely by dint of intrinsic energies is a supposition utterly opposed to our most fundamental scientific conceptions; spontaneous change, under whatever guise, being inconceivable to our mind as now constituted.

The modification of organisms by external agents, expressing —as everyone will admit—an incontestable truth of nature, the exigencies of science make it imperative on us to inquire into the positive manner and means by which the constitution and the properties of the morphological units become altered through the action of external forces. This investigation involves necessarily an examination of all the fundamental properties of life, for we cannot proceed very far in our research without becoming aware that all vital properties are mutually interdependent, so that it would be an unprofitable effort to try to gain a separate understanding of any single one of them. We have then to set to work to find out with some degree of precision how the activities of life are connected with each other at their common source, the cellular protoplasm; and it is incumbent on biology not to disavow the task, however difficult it may seem. All complex organisms are said to be aggregates of morphological units; all phenomena of life, resultants of the peculiar energies of these units. Forces emanating from external sources induce changes in organic forms and functions. The effect of these modifying forces can be wrought only on the intimate structure and properties of the efficient elements. Biology is the science of organic forms and changes. Consequently, no essential progress can be made in that science without a more perfect insight

into the innermost nature of the units, by which all organic shaping and changing is directed and executed.

I have purposely dwelt so long on the necessity of turning our attention to the study of the molecular motions that constitute the life of the morphological units, because to many prominent investigators the undertaking appears still visionary, or, at least, premature. I hope, however, to convince all candid judges, who may find time and inclination to follow my statements, that the endeavour is by no means hopeless, but that, on the contrary, it may be pursued with signal profit and success. Instead of deriding as intruders into a field of fruitless speculation those bold scientific pioneers who first ventured to penetrate to the remote starting-point of vital changes, we may well feel deeply indebted to them for having pointed out, and made accessible to us, a mine of real and as yet unappropriated wealth.

When we examine the sundry attempts at a scientific elucidation of the fundamental properties of life, as energies inhering in the morphological units, we invariably find that this ultimate research into vital activities is guided by one predominant principle of Aggregation. Here, as everywhere, from the building up of the molecule to the building up of the cell and the building up of the entire organism, the grouping of elements and composition of elementary forces is the one answer ever offered by our science in explanation of any fragment of the great world-riddle—the creation of an infinitely diversified yet coherent and consistent universe within the unitary consciousness of the organic individual.

The problem, as hitherto conceived by the few illustrious thinkers who have grappled with it, consists in the representation in thought of an organic molecule, which is the bearer of such properties as will enable it to construct the organism by aggregation in directions resulting from its own intrinsic forces; and which will enable it also to effect all vital movements by the composition of its own energies with the energies of the other aggregated molecules. All modifications are thus directly wrought on the constitution of these ultimate vital molecules, and are then secondarily expressed and magnified in the altered construction of the entire organism, and in the modified display of its functions.

Before scrutinising the special suppositions connected with this view of organisation, I will mention that, by diligent and long-continued observation of protoplasmic units, I have been led to look for the solution of the problem in an entirely different direction.

I would oppose to the *aggregational* view of organisation a *segregational* view, holding that the morphological subdivisions

in the centralised organism are caused by the specification of a single protoplasmic individual, and not by the association of a multitude of such individuals. The current theory, according to which the complex animal organism comes into existence through the aggregation of a vast number of autonomous elements, I wish to supplant by a theory which strives to demonstrate that the complex animal organism is itself a unit, only partially specified into anatomical and histological provinces. This truth, so completely at variance with our present biological conceptions, has been irresistibly forced upon me during my protoplasmic studies, and this in spite of the utmost watchfulness against anything that might at all resemble Conceptualism or Platonic Realism.

The distinct morphological divisions of higher animals are, indeed, integrant, not constituent, parts. They are specialised and segregated from a pre-existing whole, and are in no way discrete and independent units joined together in the composition of a complex totality. Here, for once, we actually meet in nature with that peculiar order of precedence, which—introspectively projected—has inspired so many intuitional world-conceptions. The whole is here in all reality antecedent to its parts. The organism is prior to its tissues, the tissues prior to their supposed elements. The centralised organism is not, as universally assumed, a multiple of ultimate units, but is, on the contrary, itself one single individuality. It is resolvable neither into morphological nor into physiological elements, but remains from first to last one indivisible chemical integral, a monadic molecule of such stupendous vastness and complexity, yet withal so potent in the exact maintenance of its specific individuality, that our imagination faints in the effort to picture it.

Conscious of the immense amount and diversity of evidence that, during these last forty years of busiest scientific devotion, has been amassed by a host of enthusiastic workers in support of the Cell-theory; filled also with admiration and reverence towards the great masters who have formulated this luminous conception as the highest expression of our scientific insight into the solemn problem of life; it was only after many years of silent work had matured my conviction of its fallacies, and had supplied me—as I believe—with a far more adequate and profound view, that I have taken courage to lay before my fellow-workers the grounds and results of my dissent.

III.

Whence the centralised vitality and co-operative activity of the complex animal organism? How amidst the maze of myriads

of merely agglutinated morphological elements is one ever to reach the efficient focus, where molecular forces are weaving the form and functions of organised beings ?

Mr. Darwin, by the perfect restraint which the consciousness of real and assumed facts imposes upon his rigorously scrupulous mind, finds himself debarred from the possibility of attempting a molecular interpretation of the phenomena of life. Since the modifications undergone by organisms take place simultaneously and diversely in a great number of morphologically and physiologically independent vital units, how does it come to pass that we find all these separate changes, at the end, united and adequately represented in the minute compass of a single cell, detached from some more or less out-of-the-way part of the vast cell-aggregate ? This germinal ingathering of dispersed faculties is an organic conjuring-feat of so astounding a character, that even the renowned sagacity of our great reformer must have felt sorely taxed in the effort to discover anything like a natural and serious explanation of it. As matters actually stand, the bewildered biologist is simply compelled to imagine the sundry faculties, thus widely distributed among many discrete and disparate cells, as being severally and bodily collected from their scattered seats, and then somehow adroitly conveyed as into a single box. Whatever there may be found of mediæval grotesqueness in this more involutional than evolutional hypothesis is certainly not due to the predilections of its propounder, but solely to the exigencies of the occasion. Pangenesis is really the only hypothesis of vital phenomena compatible with the cell-theory. The propagation by inscrutable germs of the specific nature of each separate morphological unit seems—under the conditions of our present science—the only consistent way of accounting for the reproduction of old-established and newly-acquired qualities.

The task is first to explain how all the morphological units of the complex organism come to be represented in the germ-cell, and, secondly, how during the reproduction of the complex organism all its morphological units come to be evolved again in due succession and distribution. These are the questions forced upon us by the cell-theory. Pangenesis answers them in the only manner in which they can at all be answered. It assumes a mysterious power, which accomplishes the gathering and selection of the necessary gemmules, and it assumes another mysterious power, to which is entrusted the orderly combination and evolution of the gemmules. This latter power is assisted by the equally mysterious fundamental vital properties, nutrition, growth and reproduction. Pangenesis is, indeed, the *reductio ad absurdum* of the cell-theory. It offers an explanation that explains nothing to a theory that can never be explained.

But before speculating any further on the putting together of the composite organism, let us dwell for a little on the undivided nature of the morphological units, those elementary organisms in which the vital powers finally reside. Swedenborg believed the entire universe to exist in the shape of a monster-man, we lesser men representing vital units, it might be, in the big man's liver or spleen. Within the sphere of animal personality, the cell-theory is an exact reproduction of this conception; only it is supported by a great array of palpable and plausible evidence.

When, however, with unbiassed mind we contemplate the marvellous complexity of organisation reached by avowedly unicellular animals, we cannot escape the conviction that to understand the secret of their vital properties and structural differentiations, would be equivalent to the understanding of the entire secret of vitality.

Take the ciliated infusoria, for example, the Paramaecium aurelia, everywhere procurable, and you will find here hardly any organically essential part missing. You have a cortical layer, and it is from this layer that in the higher animals all sensory organs and the nervous system originates. You have a contractile layer, and it is from this layer that all ectodermic muscles are developed. You have a circumscribed and definite mass of protoplasm ministering to food-assimilation, and it is from this protoplasm that the entoderm of the so-called metazoa derives its origin. There is an oral and an aboral pole, a head and a tail, a mouth and an anus, a ventral and a dorsal aspect. There is a gullet conveying food near to the extreme end of the organism. There are depurative organs, with definite and far-reaching channels. There is also enclosed in the granular protoplasm a mysterious mass of almost hyaline substance, called the nucleus. This lively and most specifically constituted cell or animalcule darts about in all directions, sensitive to the manifold conditions of its medium. If by any means one could penetrate the vital enigma of this one living unit, one might almost rest satisfied. At all events, it would be but a secondary task to puzzle out afterwards how by a peculiar juxtaposition of myriads of units endowed with such potencies a complex organism is formed, simulating in its entirety exactly the same specific traits that are already primitively present in every one of its constituent elements.

What, then, constitutes the life of the single cell—its nutrition, growth and reproduction, its shape, heredity and adaptation, its motility and sensibility? How are these fundamental properties of animal beings connected with the material by which they are manifested.

It was Mr. Herbert Spencer, who, under the sway of the doc-

trine of Evolution, first made a serious effort to reach the ultimate seat of vitality. His circumspect and penetrating mind discerned the necessity of referring the phenomena of vital existence and development to the molecular processes occurring in the living substance. He recognised the great truth that life is essentially and primordially dynamical; that its morphological appearances result from the play of vital motions. This leading principle of biology he endeavoured to elucidate in the following manner:— We know that in a proper medium crystals will form. Some peculiar force inherent in the chemical molecules, that are the constituent units of such crystals, compels them to range themselves during solid aggregation in definite directions, and with definitely varying degrees of cohesion. The peculiar power here at work we call Polarity, merely to give it a name. Polarity then means the influence which certain molecules of the same kind exert on each other during unimpeded aggregation, so that by their conjunction a morphological unit results, specifically shaped, and having physical properties specifically varying in the sundry directions of its shape. Now it is clear, that the constituent molecules of the living substance must be immensely more complex than other molecules, much more complex even than the molecule of protein. Perhaps five or six protein-molecules, chemically linked together by phosphorus or sulphur, may represent the unit of the living substance. Units of such atomical complexity will be the bearers of highly impressible constitutions, in which changes, occurring in their environment, will become faithfully registered. Thus by exposure to different influences the molecules of the divers organisms have in the course of generical evolution become widely differentiated, each organism being now made up of units quite specific to itself, in the constitution of which units the result of the entire life-history, of the entire derivation, of the organism rests securely preserved. Concomitant with this constitutional registration of impressions there is developed the mysterious power of polarity, the same kind of power which was found to be the formative energy inherent in crystalloid molecules. The polarity of the chemical or physiological units of organisms evinces itself in the reproduction, during unimpeded aggregation of the complete adult organism. Each separate unit represents constitutionally the entire organism, and on aggregation with so many other like units as will equilibrate all their inwoven polarities, the form of the adult organism is gradually gained. The adult organism is the result and expression of the complete equilibration of the polarities inwoven during evolution into the constitution of the physiological units. It is thus that Mr. Herbert Spencer endeavours to actuate the processes ministering to organisation.

And it must be confessed that, if life is, indeed, to be shut up in a molecule, that registers evolutional changes merely by intrinsic modifications, the conception can perhaps hardly be improved upon. Grant the existence of the physiological unit, and you have to do the best you can with the given material.

But calmly viewed in the light of established scientific principles the hypothesis runs riot. It upsets everything. It refuses to bend to mechanical laws, and it contradicts evolution.

Polarity conceived as a directing force inhering in chemical molecules is not mechanically interpretable. Of course sundry attempts in that direction have been made, of which mode of explanation Redtenbacher's "System of Dynamids" may be considered typical. It is impossible to derive from atoms, conceived as points or globules, a difference of physical properties in the different directions of an aggregate of such atoms. However, it is only necessary to assume that the atoms themselves are axial beings, and that they range themselves on aggregation in directions corresponding to their axes, in order to derive whatever shape and whatever cohesive differences we need. The artifice of quietly smuggling into our premisses whatever we wish to extract from them, is here very palpable. It seems to be thought that we can reduce the strangeness of a mystery *ad libitum*, simply by decreasing the size of its material embodiment.

It is, indeed, mechanically intelligible how a globule can result on aggregation from unimpeded forces inhering in molecules, but not how the specifically deviating shape of a crystal can thrust itself into existence. Here we have, evidently, something at work counteracting the natural tendency of cohesion.

It is, however, just possible to construct a mechanical hypothesis of crystallisation, by having recourse to extrinsically directing forces. We may, for instance, imagine that thermal inequalities obtaining between the solvent and the crystallising substance, due to changes in their mutual molecular relations and to their different specific heats, may possibly give rise to a system of heat-waves forming definite stereometrical configurations, in which dynamical moulds the petrifying material gets shaped.

But allowing polarity to remain an occult property of molecules, we find that, whilst crystalloid molecules aggregate in crystals, colloid molecules, on the contrary, invariably aggregate in globules, when unconstrained. Even salts crystallising in colloidal solutions are thereby kept within globular confinement, and hyaline organic tissues, such as, for instance, crystalline lens fibres, are seen on imbibition to be converted into a number of colloidal globules. Polarity fails to build up specific colloidal

shapes of the most elementary kind; much less will it prove efficient to urge organic molecules into the divers forms of morphological units, and then, leaping the bounds of morphological individuality, still retain sufficient power further to coerce the autonomous units into the matured shape of the adult organism.

But the incompetency of Polarigenesis is by no means the greatest difficulty in the way of the hypothesis of physiological units. Physiological units have somehow to multiply, have, in fact, most prolifically to propagate, and are therefore necessarily supposed to mould foreign matter rapidly into their own specific kind. They are believed to be endowed with such gifts of fertility, as will enable them to convert outside material into a multitude of other physiological units just like themselves. Now, it is quite evident that, compared with this procreative achievement, Dr. Charlton Bastian's spontaneous generations are mere child's play; nay, even the special-creation hypothesis involves the lesser miracle. The evolutional toil of endless ages has, at last, succeeded in establishing the physiological unit of a mouse or an elephant. In its marvellously specific constitution are embodied all the divers and multitudinous characteristics of the organism to which it belongs. By dint of these laboriously inwrought faculties, it represents in itself the entire animal. To maintain its own exalted integrity against disintegrating influences requires already a stupendous exertion on its part. But more, many more, whole shoals of just such units being wanted for the construction of the vast animal aggregate, it is thought sufficient for this creative purpose to place random material in close proximity to some genealogically derived units. With implicit reliance on the efficacy of the procreative miracle, it is expected that somehow the genealogical units will prove equal to the task of converting ever so much dead pabulum into their own living likeness. It will be conceded that this generative feat would be strangely at variance with the undeniable truth that "construed in terms of evolution, every kind of being is conceived as a product of modifications wrought by insensible gradations on a pre-existing kind of being."

Of course, it will be forthwith objected, that vast amounts of foreign matter are, nevertheless, constantly and most obviously transformed into living substance. Precisely so. But, how this is effected is, as yet, a secret, though I hope it will remain a secret no longer to those who may summon up patience enough to read these few pages. However, in any case, nothing can alter the decision, that, according to the above cited formula, the physiological unit can give rise to a new being only by modifications wrought by insensible gradations upon its own self, and that

it cannot possibly convert pabulum into a dense swarm of its own kind by merely bathing in it.

It may appear rather strange that on so cardinal a point as the new production of the living unit I should have to defend the evolution-hypothesis against one of its very greatest promoters. But it serves to show how much the conception of life needs elucidation. We are all now consciously working on the plan of chemical substitution, on the evolutional plan; modifying and elaborating by degrees a common system.

Haeckel, who, ever since Darwin's awakening call, has been persistently labouring at the great task of radically evolutionising the science of life, has likewise presented us with a profound view of fundamental vital activities. The consummate biological knowledge and dauntless philosophical zeal of the illustrious investigator render this gift invaluable to all who are striving to penetrate to that remotest retreat of vitality, where with ceaseless toil molecular forces are weaving the wondrous substance of life.

According to Haeckel, the substance of a moner is as uniform as that of a crystal; for like a crystal the moner consists of an aggregate of equal molecules. Physically, chemically and physiologically every part of this homogeneous, living substance, or plasson, is endowed with all the properties of every other part, and is therefore capable of performing all the functions manifested by the entire moner. The molecule of the plasson is, like all other molecules, merely a definite combination of certain qualitative atoms. Only it is exceedingly more complex in its present highly elaborated state than the molecule of any other substance. Its properties result entirely from its chemical and physical constitution, and are in no way otherwise superadded to it. Certain atoms combined in certain ways make up certain substances, possessing certain inherent properties. This is the essence of it all, there being nothing enduring in the world save atoms. These are eternal and invariable, and are endowed with eternal and invariable energies, both physical and psychical. Concomitant with the material grouping of atoms to molecules, and of molecules to variously aggregated substances, there proceeds a combination of the energies of the respective atoms into resultant energies. The highest resultant of the kind makes itself known as the psychical energy of the higher animals. But even the least complex chemical process cannot be understood without ascribing sensation and volition to the atoms that take part in it. How could they otherwise exert their singular faculty of selective attraction? The living molecule, or plastidule, besides the properties which it has in common with other molecules, displays one energy peculiar to itself, and constituting the

essence of its vitality. It possesses, namely, memory of an unconscious kind, or the power of reproducing its own specific motion, together with such modifications as may have been wrought upon it by external influences. By dint of this faculty of intrinsic reproduction, it not only maintains its own marvellously complicated identity, but it propagates also its specific motion to the adjoining pabulum, which, thus coerced into like atomic vibrations, is thereby also transformed into plastidules of the same kind. In this manner organic propagation, a faculty believed hitherto to constitute the most inscrutable of all vital manifestations, receives a mechanical interpretation. An organism propagates its own kind merely because its ultimate molecules convert foreign material into their own likeness, by transmitting their specific motion to it. Propagation of kind is therefore, in the last instance, propagation of specific motion. With the understanding of this most fundamental vital activity, all other manifestations of life become readily intelligible. For example, we can easily conceive how growth must take place under such conditions. There is, indeed, no essential difference between the growth of a morphological unit or plastide, and the growth of a crystal. The crystal grows by apposition, or extrinsic accretion of equal molecules. The plastide grows by interposition[1] or intrinsic accretion of equal molecules. When by the addition of more and more plastidules the plastide has increased so much in bulk as to overreach the measure of its cohesive power, then division into two equal parts, or breaking up into many parts, or budding out of the plasson will occur. These well-known modes of multiplication openly displayed by the plastides are merely the visible result of the hidden propagation of plastidules.

Now it is clear, that two plastides or morphological units resulting from the division of a uniform mass of plasson, however equally endowed they may start on their separate courses, will eventually become exposed to different modifying influences. These influences will gradually change their respective plastidule-motions, thus differentiating the constitution of the two plastides. During this modifying process those plastidules which most readily adapt themselves to the changed conditions will by degrees convert all other plastidules, contained in the same morphological unit, into their own likeness, upon which the modification may be said to be thoroughly established. The plastide is then completely adapted. Now the plastide divides again, and again dissimilar influences cause further deviations from the parent-type. In this manner the differentiating opera-

[1] The word generally used in this relation is "intussusception". However, it does not accurately express the process; and, besides, I have to reserve it for a much more significant use.

tion proceeds from generation to generation, the whole series of diversified individuals representing together a many-branched genealogical tree. Each individual transmits faithfully to its offspring its own inherited motion as modified during its previous life-time. Thus by continual development from generation to generation new features are grafted on or rather are united with old traits, the last individual on the topmost twig of the evolutional tree representing the condensed result of all preceding changes.

This progressive generical differentiation is perfectly intelligible, the fundamental assumptions once granted. But now comes the difficulty. If, instead of following up the ideal ramifications in the development of separate units, derived from some primitive ancestor, with whom there has never existed any connexion in space, if, instead of contemplating such a phylogenetic tree, we fix our attention on the analogous ontogenetic tree, formed by the permanent association of a consecutive series of differentiated units, we shall find the puzzle becoming rather too much for us.

In vain have we at the start plausibly built up the vital molecule, have then derived from its multiplication the morphological unit, and then again from the multiplication of the latter an entire genealogical tree of successively differentiated individuals, and have at last constructed the complex organism by the permanent association of a complete succession of such diversified individuals; suddenly and inevitably we find ourselves here at the goal face to face again with the same old enigma of procreation. We commenced by assuming that we had conquered its secret at the very point at which it started into activity. We allowed as many plastidules as we needed to originate simply through propagation of the plastidule-motion. But now, after the propagating operation has unfolded itself to the utmost, we discover that the problem has, nevertheless, somehow evaded our penetration. Here, at the completion of the generative circuit, it confronts us again with unmitigated strangeness.

Through the propagation of plastidules the multi-cellular person was constructed. Now how is the propagation of this multi-cellular person effected? How are the diversely modified properties of its myriads of morphological units, at last, collected into a single reproductive element, the germ-cell? We have, positively, no clue as to how the plastidule of the germ-cell could have possibly registered all these miscellaneous and multitudinous impressions, so as to be fit to reproduce—by memory or anything else—the whole evolutional chain of units that makes up the complex organism.

At this stage of our inquiry we become aware of the wisdom

of Pangenesis. It is, as I have already remarked, the only consistent complement of the cell-theory. In order to conceive the complex organism as made up of individual units, we have to assume that the germ-cell is a congeries of gemmules derived from every one of those units. But why, it will be asked, a congeries of growing and multiplying gemmules, and not at once a congeries of ultimate molecules? Simply because, in order to evolve the multi-cellular organism from a single cell, we have to keep distinct all the divers potentialities, and we have also to keep intact the mystery of propagation.

It is the essence of the vital molecule, its *raison d' être* and *modus vivendi*, to convert all pabulum, all adjacent assimilable stuff, into its own likeness. If we were then to crowd the germ-cell with all kinds of plastidules derived from the divers morphological units of the organism, forthwith the assimilative and propagative energy of all the plastidules would be set going. There would ensue such a turmoil and desperate struggle for existence among the throng as would ultimately destroy the least specific difference between the units. Peace would not be restored until complete equality had been established among them all. There would result a uniform plasson filling the germ-cell, representing an entirely new being, and fit to propagate only its own kind.

But not merely in its final outcome is Haeckel's system of Perigenesis self-destructive. Its fundamental assumption includes already as many scientific antagonisms as can be brought together. We have a molecule, the movements of which are actuated by memory, and which constitutes a circumscribed order of atomic vibrations that transmits all the details of its intrinsically involved motions and outside material, without ever diminishing thereby its own inhering source of energy. This in plain language means (1) that metaphysical spontaneity actuates motion; (2) that a body knocking against another substance, or throwing its shadow on it, can thereby transform the same into its own likeness; (3) that in vital units there occurs an ever-renewed creation of the most highly specific energies out of nothing. These are rather startling propositions to enter into the groundwork of a professedly mechanical hypothesis.

All this sufficiently proves how inextricably perplexed even the foremost biological thinkers are apt to become whenever they attempt to elucidate the fundamental properties of life in keeping with the cell-theory.

The specific plastidule-movement can signify nothing but the chemical constitution of the plastidule conceived in terms of motion. How such intrinsic motions, how the specific constitu-

tion of any molecule can maintain itself amidst its colliding atoms in a multifariously resisting medium, is one of those mechanical puzzles as yet neglected by science or noticed only when materiality is altogether dissolved into modes of motions. Then we are at the end of all our scientific jugglery, and face to face with nothing but a mystic world of woven motions, gorgeously spread in phenomenal repose, and safely poised on that one mathematical point, our present consciousness.

EDMUND MONTGOMERY.

(To be continued.)

III.—ON THE FORMS OF LOGICAL PROPOSITION.

LOGICIANS have been much exercised in the attempt to determine the number and arrangement of the simple forms of proposition, and hardly any two who have reconsidered the question for themselves seem to have agreed in their decision. If we were constructing a complete theory of Logic we should have to ask what is the *true* account, by which we should understand the most fundamental account, of the nature and import of a proposition, and on this point different accounts would be in direct hostility to one another. But when we are discussing methods rather than theories, this is not necessary. The question then becomes, which is the most convenient account rather than which is the most fundamental; and convenience is dependent upon circumstances, varying according to the particular purpose we have in view. For the present purposes of inquiry, there seem to be three different accounts of the import of a proposition; the ordinary or *predication* view, the *class inclusion and exclusion* view, and that which may be called the *compartmental* view. It may fairly be maintained that one of these views must be more fundamental than the others, or possess a better psychological warrant, but it cannot be denied that they are all three tenable views; that is, that we may, if we please, interpret a proposition in accordance with any one of the three. We propose to inquire what are the prominent characteristics of each of these distinct, but not hostile, views. What are their relative advantages and disadvantages; to what arrangement and division of propositional forms do they respectively lead; and which of them must be adopted if we wish to carry out the design of securing the

widest extension possible of our logical processes by the aid of symbols?

The neglect of some such inquiry as this seems to me to have led to error and confusion. Logicians have been too much in the habit of considering that there could be only one account given of the import of propositions. Consequently, instead of discussing the number of forms of proposition demanded by one or the other view, they have attempted to decide absolutely *the* number of forms. And the very useful question as to the fittest view for this or that purpose has been lost in the too summary decision that one view was right and the others wrong.

Let us first look at the traditional four forms, *A, E, I, O;* in reference to which a very few words will here suffice. The light in which a proposition has to be consistently interpreted on this view is that of *predication.* We distinguish between subject and attribute here, and we assert that a given subject does or does not possess certain attributes. These forms appear to be naturally determined by the ordinary needs of mankind, and the ordinary pre-logical modes of expressing those needs; all that Logic has done being to make them somewhat more precise in their signification than they conventionally are. They adopt, as just remarked, the natural and simple method of asserting or denying attributes of a subject, that is, of the whole or part of a subject; whence they naturally yield four forms,—the universal and particular, affirmative and negative. For all ordinary purposes they answer admirably as they are, and by a little management they can be made to express nearly all the simple forms of assertion or denial which the human mind can well want to express.

With regard to these forms it must be very decidedly maintained that, as they generally and primarily regard the predicate in the light of an attribute and the subject in that of a class (whole or part), they do not naturally quantify this predicate: that is, they do not tell us whether any other things besides the whole or partial class in question possess the assigned attribute. No doubt they sometimes decide this point indirectly. Thus in the case of a universal negative proposition we can easily see that anything which possesses the attributes in the predicate cannot possess the attributes distinctive of the subject; that is, that the proposition can be simply converted. But this does not seem to be any part of the primary meaning of the proposition, which thinks of nothing but asserting or denying an attribute, and does not directly inquire about the extent of that attribute, or where else it is or is not to be found.

As just remarked, these forms of proposition certainly seem to represent the most primitive and natural modes in which

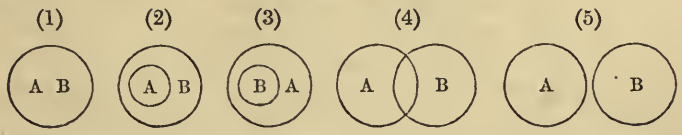
thought begins to express itself with accuracy.[1] By combining two or more of them together they can readily be made equivalent to much more complicated forms. Thus by combining 'All X is Y' with 'All Y is X' we obtain the expression 'All X is all Y,' or 'X and Y are coextensive,' and so forth. As these familiar old forms have many centuries of possession in their favour, and the various rules for conversion and opposition, and for the syllogism, have been devised for them, there seem to be very strong reasons for not disturbing them from the position they have so long occupied. At least this should only be done if it could be shown either that they are actually insufficient to express what we require to express, or that they rest upon a wrong interpretation of the import of a proposition. The former is clearly not the case, for as was just remarked (and as no one would deny), a combination of two or more of these forms will express almost anything in the way of a definite statement. And as regards the latter, the point of this essay is to show that we are not necessarily tied down to one exclusive view as to the import of a proposition. I should say, therefore, that whatever other view we may find it convenient to adopt for special purposes, either of sensible illustration or with a view to solving intricate combinations of statements, there is no valid reason for not retaining the old forms as well. They may not be the most suitable materials for very complicated reasonings, but for the expression and improvement of ordinary thought and speech they are not likely to be surpassed.

So much for this view. Now suppose that, instead of regarding the proposition as made up of a subject determined by a predicate, we regard it as assigning the relations, in the way of mutual *inclusion* and *exclusion*, of two classes to one another. It will hardly be disputed that every proposition *can* be so interpreted. Of course, as already remarked, this interpretation may not be the most fundamental in a psychological sense; but when, as here, we are concerned with logical methods merely, this does not matter. For the justification of a method it is clearly not necessary that it should spring directly from an ultimate analysis of the phenomena; it is sufficient that the analysis should be a correct one.

Now how many possible relations are there, in this respect of mutual inclusion and exclusion, of two classes to one another? Clearly only five. For the question here, as I apprehend it, is this:—Given one class as known and determined in respect of

[1] At least this seems so in all the languages with which we need consider ourselves concerned. What might be the most natural arrangement of the forms of propositions in non-inflectional languages I must leave to philologists to determine.

its extent, in how many various relations can another class, also known and similarly determined, stand towards the first? Only in the following: It can coincide with the former, can include it, be included by it, partially include and partially exclude it, or entirely exclude it. In every recognised sense of the term these are distinct relations, and they seem to be the only such distinct relations which can possibly exist. These five possible arrangements would be represented diagrammatically as follows:—



Before comparing in detail the verbal statement of these five forms with that of the four old ones, it must be pointed out how entirely the distinction between subject and predicate is robbed of its significance on such a scheme as this. The terms of the proposition being thus classes of things of known extent, this distinction sinks down into one which is purely grammatical. It is the merest accident which of the two classes is represented first in our verbal statement; whether, for instance, in (2) we say that B lies outside A, or that A lies inside B. Certainly when the diagrammatic representation alone was shown to us, no one could give a guess as to which circle was intended to stand for a subject and which for a predicate. He could not, that is, read the diagram off in one way and one way only, with confidence.

A very little consideration will serve to convince us that this scheme of five forms, and the old one of four, will not by any means fit in with one another. Considering that they spring from different interpretations of the import of a proposition, it could not be expected that they should do so. (5) is the one unambiguous exception, corresponding precisely to the universal negative 'No A is B'. That is—given 'No A is B' we could only select this diagram; and conversely, given this diagram we could only utter it as 'No A is B'. But such correspondence does not exist in any other case. Given 'All A is B' we could not but hesitate between diagrams (1) and (2); and if diagram (4) were shown we should not know whether to describe it as 'Some A is B' or 'Some A is not B,' for it would fit either equally well.

Is there then no precise and unambiguous way of describing these five forms in ordinary speech? There is such a way, and to carry it out demands almost no violence to the established usage

of language. It is merely necessary to say definitely that the word *some* shall signify 'some, not all'; a signification which on the whole seems more in accordance with popular usage than to say with most logicians that it signifies 'some, it may be all'. If we adopt this definition of the word our five diagrams will be completely, accurately and unambiguously expressed by the five following verbal statements:—

All A is all B.
All A is some B.
Some A is all B.
Some A is some B.
No A is any B.

That is—given one of these statements, only one diagram could be selected for it; and conversely, given any one diagram it could only be matched with one of these forms of words.

The tabular expression of these five forms will naturally recall to the reader's mind the well-known eight forms adopted by Hamilton, *viz.*:—

All A is all B.	No A is any B.
All A is some B.	No A is some B.
Some A is all B.	Some A is not any B.
Some A is some B.	Some A is not some B.

I might have termed the view as to the import of propositions now under discussion the Hamiltonian, instead of the *class inclusion and exclusion* view. It seemed better, however, at the outset to state the view independently in what seemed its most fundamental and characteristic form. Moreover, one is not so necessarily introduced into a well known and rather bitter controversy. At the same time I must state my own very decided opinion that the view in question is that which Hamilton, and those who have more or less implicitly followed him in his tabular scheme of propositions, are bound in consistency to adopt.

The logicians in question do not seem to me, indeed, to have at all adequately realised the importance of the innovation which they were thus engaged in introducing; nor, it must be added, the inadequacy of the means they were adopting for carrying it out. What they were really at work upon was not merely the rearrangement, or further subdivision, of old forms of proposition, but the introduction of another way of looking at and interpreting the function of propositions. The moment we insist upon 'quantifying' our predicate we have to interpret our propositions in respect of their extension; that is, to regard them as expressing something about the actual mutual relations of two classes of things to each other. The view of the proposition

must be shifted from that of stating the relation of subject and predicate, or of object and attribute, to that of stating the relation of inclusion and exclusion of two classes to one another.

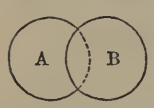
The question therefore at once arises, How do the eight verbal forms just quoted stand in relation to the five which we have seen to be, in their own way, exhaustive? As this is a very important inquiry towards a right understanding of the nature and functions of propositions, I shall make no apology for going somewhat into details respecting it. As regards the first five out of the eight, the correspondence is of course absolutely complete, if we understand that Hamilton's 'some' is to be understood, with ours, as distinctly excluding 'all'. But then, if so, what account is to be given of the remaining three out of the eight? But one account, I think, can be given. They are superfluous, or ambiguous equivalents for one or more of the first five. This may need a moment's explanation. By calling the first five complete and unambiguous we mean, as already remarked, that if one of these propositions was uttered, but one form of diagram could be selected in correspondence; and conversely, if a diagram were pointed out it could only be referred to one form of verbal expression. But if we were given one of the latter three to exhibit in a diagram we could not with certainty do so. Take, for instance, the proposition 'No A is some B'. If we had to exhibit this in a diagram we should find that diagrams (2) and (4) are equally appropriate for the purpose; whence this proposition is seen to be ambiguous and superfluous. Similarly, the proposition 'Some A is not any B,' is equally fitly exhibited in diagrams (3) and (4), and therefore appropriately in neither. Consequently it also must be regarded as needless in our scheme. The case of the remaining proposition, 'Some A is not some B,' is still worse. It is equally applicable to four of our five distinct possible cases, and therefore, as making no distinction whatever between one such proposition and another, this form is altogether useless to express the mutual relations of classes.

The ambiguity affecting these three last forms is, it need hardly be remarked, reciprocal. That is, so long as these three are retained in the scheme, we should not know, on a diagram being presented to us, which proposition was meant to be exhibited; any more than we can draw the diagram when a proposition is stated. Diagram (3), for instance, might under these circumstances be read off indifferently as 'Some A is all B,' 'Some A is not any B,' or 'Some A is not some B'.

It may perhaps be replied that there is still a use in retaining forms of proposition which thus refer ambiguously to two or more actual class relations, in addition to those forms that refer unambiguously to one only. It may be urged that if we do not

know which of the two is really applicable, though one or the other must certainly be so, there is an opening for a form which covers both of them. I do not think that this will do. In the first place it may be objected that the employment of terms in their extensive signification implies that we are expressing their actual relation to one another in the way of inclusion and exclusion, and not our imperfect knowledge of that relation. At any rate this seems to be so when we make use of diagrams of this kind, for the circles must either cut one another or not do so; we cannot express a *doubt* whether they do or not. We may feel a doubt whether they should do so or not, but we must make them do one or the other.

An attempt is sometimes made in this way by the device of marking a part of one of the circles with a dotted line only. Thus 'Some A is not B' would be exhibited as follows:—



(as, for instance, is done, amongst others, by Thomson in his *Laws of Thought*). The dotted part here represents of course our ignorance or uncertainty as to whether the line should lie partly inside B, or should entirely include it. But surely, if we are thus ignorant, we have no business to prejudge the question by putting it inside, even as a row of dots. What we ought to do is to draw *two* lines, one intersecting B and the other including it. Doing this, there is no need to dot them; it is simpler to draw at once, in the ordinary way, the two figures (3) and (4) above, and to say frankly that the common 'Some A is not B' cannot distinguish between them. In other words this form cannot be adequately represented by one of these diagrams: it belongs to another propositional theory.

But there is a more conclusive objection than this last. If we were lenient enough to admit the three latter Hamiltonian forms on such a plea as the one in question, we should be bound in consistency to let in a good many more upon exactly the same grounds. Take, for instance, the first two, 'All A is all B,' 'All A is some B'. We often do practically want some common form of expression which shall cover them both, and this was excellently provided by the old *A* proposition 'All A is B,' which just left it uncertain whether the A was all B, or some B only. Perhaps this is indeed the very commonest of all the forms of assertion in ordinary use. Hence if once we come to expressing uncertainties or ambiguities we should have to insist upon retaining this old *A*, not as a substitute for one of the two first Hamiltonian forms, but in addition to them both. Similarly we should require a form to cover the first and the third. Or again, whilst we are about it, we might desire a form to cover all the first four; for we might merely know (as indeed is often the

case) that A and B had some part, we did not know how much, in common. What we should want, in fact, would be a simple equivalent for 'Some or all A is some or all B'; or, otherwise expressed, a form for merely denying the truth of 'No A is B'.

The Hamiltonian scheme has, no doubt, a specious look of completeness and symmetry about it. Affirmative and denial, of some and of all, of the subject and predicate, gives clearly $2\times2\times2=8$ forms. But on subjecting them to criticism, by inquiring what they really say, we see that this completeness is illusory. Regard them as expressing the relations of class inclusion and exclusion (and this I strongly hold to be the right way of regarding them) and we only need, or can find place for, *five*. Regard them as expressing to some extent our uncertainty about these class relations, and we want more than eight. This exact group of eight seems merely the outcome of an exaggerated love of verbal symmetry.

If indeed our choice lay simply between the old group and the Hamiltonian, the old one seems to me the soundest and most useful. One or more of those four will express almost all that we can want to express for purely logical purposes, and as they have their root in the common needs and expressions of mankind, they have a knack of signifying just what we want to signify and nothing more. For instance, as just remarked, we may want to say that 'All A are B,' when we do not know whether or not the two terms are coextensive in their application. The old form just hit this off. An obvious imperfection in Hamilton's scheme is that with all his eight forms he cannot express this very common and very simple form of doubtful apprehension, by means of a single proposition. He can express the less common state of doubt between the two 'All A is some B,' and 'Some A is some B,' by one of what I have termed his superfluous forms, *viz.*, by his 'Some B is not any A,' for it exactly covers them both.[1]

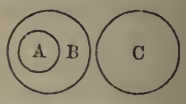
So long as we adhere to the five propositions which correspond to the five distinct diagrams, we are on clear ground. These rest on a tenable theory as to the import of propositions, sufficient to give them cohesion and make a scheme of them. That theory is of course that they are meant to express all the really distinct relations of actual class inclusion and exclusion of two logical terms, and none but these.

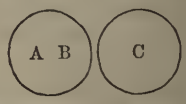
The advantages of this form of propositional statement, if few, are at any rate palpable and unmistakable. Each form has a corresponding diagram which illustrates its exact signification with the demonstrative power of an actual experiment. If any

[1] Provided of course we define 'some' = 'some, not all'. This I understand Hamilton to do; but his opinion does not seem absolutely fixed here.

sluggish imagination did not at once realise that from 'All A is some B,' 'No B is any C,' we could infer that 'No A is any C,' he has only to trace the circles, and he sees it as clearly as any one sees the results of a physical experiment. And most imaginations, if the truth were told, are sluggish enough to avail themselves now and then of such a help with advantage.

But whilst this is said it ought clearly to be stated under what restrictions such an appeal may fairly be made. The common practice, adopted in so many manuals, of appealing to these diagrams—Eulerian diagrams as they are often called—seems to me very questionable. Indeed when it is done, as it generally is, without a word of caution as to the important distinction between the implied theories about the import of propositions, it seems to me that there can be no question as to its being wrong. The old four propositions *A*, *E*, *I*, *O*, do *not* correspond to the five diagrams, and consequently none of the figures in the syllogism can be properly represented thus.[1] We may sometimes see *Celarent* represented in the annexed form. But this is too narrow. The affirmative represented here is not 'All A is B,' but 'All A is *some* B'. To represent *Celarent* adequately in this way we should have to append also the diagram, representing 'All A is all B,' 'No B is C,' and to say frankly that we can only know that one of these diagrams will represent our syllogism; we do not know which.[2] (The necessity of such an appeal to *alternative* diagrams is, I see, admitted by Ueberweg.)





Of course this inability to represent each syllogistic figure by one appropriate diagram will not always affect their cogency as illustrations. Any one can see in the above instance that one diagram will practically take the place of the other; and so it would in *Barbara*, but not in every instance, as we might easily show in detail. But none the less must we remember that the systems of propositions are really based on distinct theories, and we have consequently no right thus without warning to use the diagrams of one system to represent the propositions and syllogisms of another.

[1] The *rejected* figure 'No B is C,' 'No A is B,' with the consequent inability to draw any conclusion at all, *can* be thus exhibited; because the universal negative is the only form common to the two schemes.

[2] If it be urged that the upper diagram is the general one, including the lower as a special case, the answer is twofold. First, that this would be tantamount to a rejection of our scheme of five distinct propositions; and secondly, that even so we should not meet the case of syllogisms involving particular propositions, as the reader will see if he tries thus to exhibit, say, *Disamis*.

So much then for this second scheme of propositional import and arrangement. In spite of its merit of transparent clearness of illustration of a certain number of forms, it is far from answering our purpose as the basis of an extension of Logic. It soon becomes cumbrous and unsymmetrical, and has no flexibility or generality about it. Fortunately there is another mode of viewing the proposition, far more powerful in its applications than either of those hitherto mentioned. It is the basis of the system introduced by Boole, and could never have been realised by any one who had not a thorough grasp of those mathematical conceptions which Hamilton unfortunately both lacked and despised. The fact seems to be that when we quit the traditional arrangement and enumeration of propositions we must call for a far more thorough revision than that exhibited on the system just discussed. Any system which merely exhibits the mutual relations of two classes to one another is not extensive enough. We must provide a place and a notation for the various combinations which arise from considering three, four, or more classes; in fact we must be prepared for a complete generalisation. When we do this we shall soon see that the whole way of looking at the question which rests upon the mutual relation of classes, as regards exclusion and inclusion, will not suffice. There is a fatal cumbrousness and want of symmetry about it which renders it quite inappropriate for any but the simplest cases.

This third view of the interpretation of propositions which has to be substituted for both the preceding, for the purpose of an extended Symbolic Logic, is perhaps best described as indicating the *occupation or non-occupation of compartments.* What we here have to do is to conceive, and invent a notation for, all the possible combinations which any number of class terms can yield; and then find some mode of symbolic expression which shall indicate which of these various compartments are empty or occupied, by the implications involved in the given propositions. This is not so difficult as it might sound, since the resources of mathematical notation are quite competent to provide a simple and effective symbolic language for the purpose. Without entering fully into this scheme, enough may be said to bring out clearly its bearing on the particular subject which now occupies us, *viz.*, the number of distinct forms of proposition which ought to be recognised. The view which is here taken is still distinctly a *class*, rather than a predication, view; but instead of regarding the mutual relation of two or more classes in the way of inclusion and exclusion, it substitutes a complete classification of all the subdivisions which can be yielded by putting any number of classes together, and indicates whether any one or more of these classes is occupied; that is, whether

things exist which possess the particular combination of attributes in question.

A fair idea of the meaning, scope, and power of this system will be gained if we begin with two class terms X and Y, and consider the simple cases yielded by their combination. It is clear that we are thus furnished with four possible cases, or *compartments*, as we shall often find it convenient to designate them; for everything which exists must certainly possess both the attributes marked by X and Y, or neither of them, or one and not the other. This is the range of possibilities, from which that of actualities may fall short; and the difference between these two is just what it is the function of the proposition to describe. It will be best to discuss here only intimations that such and such compartments are *empty*, since this happens to be the simplest case. Now how many distinct cases does this system naturally afford? We must approach it, let us remember, without any prepossessions derived from the customary divisions and arrangements.

We should naturally be led, I think, to distinguish fourteen different cases on such a system as this, which would fall into four groups. For there may be one compartment unoccupied, which yields four cases; or two unoccupied, which yields six cases; or three unoccupied, which yields again four cases; or none unoccupied, which yields but one case. *All* cannot be unoccupied, of course, for we cannot deny both the existence and the non-existence of a thing; or, to express it more appropriately on this scheme, given that a thing exists it must be put somewhere or other in our all-extensive scheme of possibilities.

I will only call attention here to the nature of the four simplest out of these 14 cases. Writing, for simplicity, $\bar{x}$ for not-x, and $\bar{y}$ for not-y, these four would be thus represented:—

$xy=0$ or No x is y.
$\bar{x}y=0$ or All y is x.
$x\bar{y}=0$ or All x is y.
$\bar{x}\bar{y}=0$ or Everything is either x or y.

On this plan of notation, of course, xy stands for the compartment, or class, of things which are both x and y; and the expression $xy=0$ states the fact that that compartment is unoccupied; that there is no such class of things. And similarly with the other sets of symbols.

A moment's glance will convince the reader how entirely distinct the group of elementary propositions thus obtained is from that yielded by either of the other two schemes; though, starting from its own grounds, it is just as simple and natural as either of them. Of the four simplest forms contained in it,

as indicated above, one is of course the Universal Negative, which presents itself as fundamental on all the three schemes. Two others are Universal Affirmatives, but with the subject and predicate converted. But the fourth is significant, as reminding us how completely relative is the comparative simplicity of a propositional form. On the present scheme this is just as simple as any of the others; but in the traditional arrangement it would probably get in only as a disjunctive, since that arrangement dislikes the double negation 'No not-x is not-y'. Indeed on hardly any view could such a verbal statement as this last be considered as elementary, since almost every one would have to put it into other words before clearly understanding its import on a first acquaintance.

We might easily go through the ten remaining cases referred to above, but to do so would be unsuitable to a general essay like this. It may just be noticed, however, in passing, that the emptying out (as we may term it) of two compartments does not necessarily give a proposition demanding more of the common verbal statement, than that of one only does. For instance the combination, $x\bar{y}=0, \bar{x}y=0$, expresses the coincidence of the two classes x and y; it is 'All x is all y'. That of xy and $\bar{x}\bar{y}$ yields the statement that x and y are the contradictory opposites of one another; that x and not-y are the same thing, and consequently y and not-x.

The real merits of this way of regarding and expressing the logical propositions are not very obvious when only two terms are introduced, but it will readily be seen that some such method is indispensable if many terms are to be taken into account. Let us introduce three terms, x, y, and z; and suppose we want to express the fact that there is nothing in existence which combines the properties of all these three terms, that is, that there is no such thing as xyz. If we had to put this into the old forms we should find ourselves confronted with six alternative statements, all of them tainted with the flaw of unsymmetry, *viz.*, 'No x is yz,' 'No y is xz,' 'No z is xy,' as well as the three converse forms of these. No reason can be shown for selecting one rather than another of these; and if we attempted to work with the symmetrical form 'There is no xyz,' we should find that we had no rules at hand to connect it with propositions which had only x, y, or z for subject or predicate.

If we tried the second propositional theory we should only reduce the above six unsymmetrical alternatives to three; three being got rid of by our refusing to recognise that conversion makes any difference in the proposition. But the same inherent vice of unsymmetry in a choice of alternatives would still confront us. No reason could be given why we should rather say

that the class x excludes the class yz, rather than that the class y excludes that of xz, or z that of xy. Common language may be perfectly right in tolerating such ambiguities; but a sound symbolic method ought to be naturally cast in a symmetrical form if it is not to break down under the strain imposed by having to work with three or more terms. This requires us to avoid such forms as 'The class x excludes that of yz,' and all the analogous statements of the common Logic, and to put what we have to express into the symbolic shape $xyz=0$. The verbal equivalents for this are, of course, that there is no such thing as xyz, or that the compartment which we denote by xyz is empty. There are theoretical reasons for regarding the latter form as the most rigidly accurate and consistent.

It deserves notice that ordinary language does occasionally recognise the advisability of using symmetrical expressions of this kind, though the common Logic shows no fondness for them. We should as naturally say, for example, that 'Cheapness, beauty, and durability never go together,' or that 'Nothing is at once cheap, beautiful, and durable,' as we should use one of the forms which divide these three terms between the subject and the predicate. But this latter plan is what would be adopted presumably by the strict logician, by his arranging it in some such form as 'No cheap things are beautiful and durable'. It need not be remarked that popular language, though occasionally making use of such symmetrical forms, has never hit upon any general scheme for their expression, and would be sadly at a loss to work upon more complicated materials. Especially would this be the case where negative predicates or attributes had to be taken into account as well as positive. However, what we are here concerned with is the insufficiency of the ordinary logical view rather than the occasional ingenuity of popular expression.

In these remarks it has been attempted to keep closely to the inquiry suggested at the outset—that, namely, of the number of fundamentally distinct logical forms, and the foundation on which each different arrangement must be understood to rest. It seems quite clear that no attempt can be made to answer this question until we have decided, in a preliminary way, what view we propose to take of the proposition and its nature. There is no occasion whatever to tie ourselves down to one view only, as if the import of propositions was fixed and invariable. Very likely other views might be introduced in addition to the three which have been thus examined, though these appear to me to be the only ones with which the student is likely to have to make much acquaintance.

Each of these three stands upon its own basis, yields its appropriate number of fundamentally distinct propositions, and

possesses its own merits and defects. The old view has plenty to say for itself, and for ordinary educational purposes will probably never be superseded. It is very simple, it is in close relation with popular language, and it possesses a fine heritage of accurate technical terms and rules of application. Its defects seem to me to be principally these: that it does not yield itself readily to any accurately correspondent diagrammatic system of illustration; and that its want of symmetry forbids its successful extension and generalisation.

The great merit of the second plan—that of class inclusion and exclusion—is its transparent clearness of illustration. We may be said thus to *intuite* the proposition. This has indeed caused a most unwarranted amount of employment of its diagrams by those who do not realise that its five distinct forms of proposition cannot be properly fitted in with the four of the traditional scheme. This clearness is, however, almost its only merit. It possesses little more of symmetry or consequent adaptability of generalisation than the former, and it is considerably removed from popular forms of expression. Above all, as it insists upon exhibiting the *actual* relations of the two classes to one another, it has no power to express that degree of ignorance about these relations which many propositions are bound to do, if they are to state all that we know, and nothing but what we know, about the relation of the subject and predicate to one another. (Hamilton's eight propositions, as already remarked, seem an inconsistent and partial attempt to remedy this latter defect.)

The third scheme is, of course, in comparison with the others, an artificial one, and possesses the merits and defects which might be expected in consequence. It is couched in too technical form, and is too far removed from the language of common life, for it ever to become a serious rival of the traditional scheme on the ground appropriate to the latter. For symmetry, however, and the power which comes of symmetry, nothing can well be put into competition with it.

JOHN VENN.

NOTE.—Though the majority of logicians seem to be satisfied with the Eulerian mode of representing the ordinary logical propositions, there have always, I find, been some who have felt its insufficiency for the purpose. Ueberweg, for instance, offers an *alternative* of diagrams in some cases. But of all the writers whom I have been able to consult since this paper was in type, the two who lay most stress upon the point are Gergonne and F. A. Lange. The former of these (*Annales des Mathématiques*, vii., 189) has made a careful comparison between the five diagrammatical forms and the four propositional ones, showing in each case how many of the one set are included in any single form of the other. Lange (*Logische Studien*) has spoken even more strongly than I have here, though from a somewhat different point of view, on the radically distinct theories of the import of propositions involved in these two ways of stating or representing them. He has also worked out, as I had done, the number of distinct forms corresponding to the syllogistic figures which are demanded on the Eulerian scheme.

IV.—PERFECTION AS AN ETHICAL END.

The existence in human nature of a moral impulse or desire of right is the ultimate fact on which the science of Ethics depends for all its value.

The origin of this desire, which is to be found in different individuals in very different degrees of strength, has been accounted for in a variety of ways, but its claim to rank among the immediate springs of action has seldom been seriously disputed. It constitutes the motive power to which Ethics undertakes to act as guide, and ethical inquiries would lose at once all their practical interest if doubts were entertained as to its existence. The different views which have been taken of the *end* to which this desire should be directed have given rise to several distinct and separate "Methods of Ethics"—to use the phrase which Mr. Sidgwick has rendered familiar. One of these methods takes happiness—either individual or general—as its end (or that alone which is absolutely good), and pronounces everything else to be good only in the degree in which it tends to produce this happiness. There are certain rules of conduct on another view, the moral value of which can be intuitively judged of, and conformity to these rules is proclaimed to be the final test and standard of conduct.

By others, again, it is maintained that the end to be aimed at is a right balance of the inward dispositions and motives. Perfection, it is thought, will be reached when the appetites, affections, and desires shall have been brought by cultivation and repression to a certain desired degree of strength; though what this precisely is we are seldom clearly told.

Now, widely as these methods are seen to differ from each other, and various as are the ideals of life which underlie them, they have all this point in common, that they regard the "moral motive," or desire of right, as a *means* only to something other than itself.

It is a motive, they one and all assume, which will have fulfilled its purpose and ceased to exist whenever a certain definite state of things shall have been reached, whether this state of things be taken to be universal happiness, or conformity to certain absolute rules, or the establishment of a certain inward balance of motives.

Its value in the eyes of most moralists is therefore *relative*, not *absolute*, and differs in degree only and not in kind from that which is ascribed to systems of government and other human institutions. It is now pretty generally acknowledged that there is no such thing as an absolutely good form of government,

though there are still some persons who cling to the belief that the precise constitution needed for a particular country is a thing that can be determined on *à priori* principles.

The old notions of "absolute rights," and "the best form of government," which once had so much influence, are now rapidly dying out, and are giving place to the more rational view that the value of every human institution must vary with the state of society, and must in all cases be dependent on conditions of time and place.

Now the relative and temporary value which is thus ascribed to government is all that moralists are commonly willing to allow to the moral motive or desire of right.

Some ideal of life is framed, and they value this motive as a means of giving reality to it. They look forward in imagination to a time when men shall have outlived the need for any such controlling influence; when natural impulses, desires, and affections shall have attained their due and proportionate development, or when the "greatest happiness of the greatest number" shall have become an accomplished fact, instead of being as at present an unmeaning and deceitful phrase.

Now it seems to me that we should be taking a truer view of the relations of ethical phenomena and providing a more satisfactory basis for a system of Ethics if we were to reverse completely the order that is here maintained, and to take the desire of right or love of duty as the *end*, towards which all other motives, together with all acts bodily or mental, all institutions, and, finally, all life itself, are to stand in the position of *means*. I regard the desire of right as the only thing having absolute worth in the universe, and I believe that the moral value of everything else can be measured by the degree in which it tends to strengthen or impair this desire; my ideal of perfection being a state of things where it shall have vanquished and destroyed every meaner impulse of man's nature, and constituted itself the sole impelling force to which he yields obedience.

In order to make any practical use of such an ideal as this, and to justify our taking it as our ethical end, we must be able to show that it is one which is fitted to supply a guide and test of men's actions in their present state of imperfection. We must be able to show that all those acts and motives which we are accustomed to approve or condemn with reference to other ethical ends, have a definite value in relation to this end also. We must show, in short, that tendency to perfection is a test which is capable of being as universally applied as tendency to happiness, or any other standard by which the moral worth of actions and motives has commonly been tried. This is a point which has not unfrequently been neglected by those who have

before now insisted on the superiority of the moral impulse to all the other springs of action, and on its claim to supersede them in virtue of this superiority.

After stating their ideal of perfection, they have commonly made no attempt to suggest any means of attaining it, and have even at times made use of language which could imply that, in their opinion, no such means are needed. They have preached the necessity of acting solely out of regard for duty, and of yielding obedience to no inferior motive, as though this were advice that men had the power to realise in their present weakness and imperfection. To call in the aid of an inferior motive from sense of weakness or fear of falling, has been spoken of as making a compromise or "parleying" with sin,[1] and condemned as a mean evasion of the duties implied in the possession of a moral nature. Now, sentiments of this kind may possibly look well in a sermon or a poem, but they are very far removed from the region of practical life, and can obviously afford no satisfactory guide to conduct. The men who deliver them are for the most part wholly unable to act up to their spirit, and have probably never seriously considered what their advice, if put in practice, would amount to. It is easy to talk of "crucifying" the flesh and the affections, and of acting only from the pure law within, but, until we hear of a man whose whole life, from the time that his moral faculty first made itself felt, was passed in obedience to its promptings, we shall refuse to believe that advice of this kind can lead to any practical result, or do anything in fact but repel men by its extravagance. In the great majority of cases it would be simple mockery to tell a man groaning under the weight of evil habits to abandon his sin at once and act henceforth as his sense of duty shall dictate. Habits are not things that can be lightly and easily shaken off, and in ninety-nine cases out of a hundred a man's love of right and duty has no power to effect a sudden change like this, and to raise itself at once to the supreme control of life.

Dismissing, then, the idea that moral perfection is a thing which lies within the reach of mankind at the present stage of their history, and allowing that if it ever come at all, it must come as the slow result of a long process of development, we must set ourselves to examine into the general character of this process, and to test the worth of the things to which moral value is commonly thought to belong, by their tendency and power to aid it.

The change we are imagining, it may be well to repeat, is one from a state of things where men act partly out of regard for

[1] Abercrombie's *Culture and Discipline of the Mind.*

duty, and partly—and far more largely—from other motives, to a state of things where love of duty shall remain the sole impelling motive; and what we have got to do is to find out how this change can be most easily and swiftly brought about, and what are the different agencies that can be made to assist in the work.

In searching for an answer to this question it is natural in the first place to ask whether any means are known to exist by which the impulsive power of one motive can be taken from it and made over to another. Is there any process in the moral world answering to what is known in the physical world as the "transmutation" or "conversion of energy"? If it can be shown that what may be termed "moral energy" or motive power can be made to assume different forms in the same way that mechanical force can be converted into heat, and heat again into electricity, we shall be able to see at once what the general character of moral progress will be likely to be. We can see that it may be possible for love of right or duty, which at present is but one of many forms of impulse, to take to itself gradually the strength of all the rest, and raise itself in time to the position of sole ruler of life. We can see too that the amount of transmutation already effected may not unfairly be taken as the measure and standard of moral development. The practical question therefore is whether as a matter of fact any such means exist by which one motive can be deprived of its power, and another proportionately strengthened.

Now, I venture to think that we have all that is wanted to enable us to answer this question in the affirmative in the common tendency of *acts* of all kinds to strengthen the motives which give rise to them.

It has frequently been pointed out that motives gain in strength in exact proportion to the amount of action they occasion, and as action implies that one motive (or set of motives) has been successful in resisting another (or others), and, as defeat leads to loss of strength, on the same principle that success leads to increase of it,—the change in the balance of motives which accompanies action may not inaptly be compared with that which takes place when physical energy is destroyed in one of its forms and made to reappear in another.

When acts of kindness, for example, have been prompted by natural affection or benevolence, the power of these motives will invariably be found to have increased, and the selfish impulses which opposed them to have undergone a proportionate degree of weakening. When a fit occasion again presents itself for the exercise of benevolence, there will be found to be less difficulty in resisting the opposing forces and acting as the charitable im-

pulses may dictate. It is well known, again, that the impelling power of the appetites and passions is increased by every fresh act of indulgence, and that, if not checked in time by the opposition of other motives, there is danger of their becoming too strong for these latter, and mounting by their depression to the supreme control of life.

In the same way, the development of the moral impulse or love of duty can only take place at the expense of the other and inferior springs of action. Coming into existence at a later stage than the impulses and desires which have regard to self, it must win its way to power by gradually resisting and overcoming them; gathering strength by each successive conquest, just as certain cannibals are said to imagine that the strength of a conquered and digested foe becomes the possession of his conqueror.

In the state of things which we have taken as our ideal of perfection, the moral motive will have concluded its victorious career by subduing and depriving of their power those desires and motives even which in our present state of imperfection we rightly regard with reverence. The affections which sweeten life will then have ceased to rule it, and pleasure and happiness will be content to follow in the footsteps of duty, and claim no more to act as independent guides. Instead of being motives to action, they will remain only as its incidents and accompaniments, and will no longer exert the disturbing influence which at present draws so many from the path of duty.

Thus we see that our ideal perfection implies the final destruction by the love of duty of *all* the other motives by which mankind are at present swayed, and it may possibly seem to follow from this that there can be no real difference between these latter in point of moral value. This, however, is by no means the case, and if the theory I am advocating were to involve any such consequence it would rightly be put aside at once as carrying an absurdity upon the face of it.

I acknowledge that there is the utmost possible difference in moral value between the various motives by which men's conduct is governed, but, at the same time, I maintain that this value is *relative* and *temporary* only, and that *absolute* worth belongs to the pure love of right alone which in the end is intended to destroy them.

I will now proceed to state what appears to me to be the real ground of the difference which undoubtedly exists between the different springs of action in respect of their moral quality, and to explain shortly the nature of the service which in different degrees they have all the power to render. The love of duty, as I remarked before, is a motive which comes into operation at a

comparatively late period of life. It has no influence over the first years of infancy, and therefore by the time it begins to make itself felt many other motives will naturally have attained to a considerable degree of strength. They will have been enjoying a period of unrestricted liberty, in which they have been suffered to grow up and gather strength unchecked—so far at least as moral control is concerned. Accordingly, as the progress and development of the moral motive is no assured thing which has been fated and decreed beforehand, but is subject to the same laws which regulate the growth and decay of all other motives, there is grave reason to fear that, in its first attempts to overcome other impulses and assume the control of action, the love of duty may meet with a decided check, and that repeated failure and consequent loss of strength may lead in time to its final annihilation—the state of things which existed in early infancy being thus brought back again in all but its former innocence.

It is here, then, that the moral value of other motives comes first into view. The love of duty, whenever it finds that the task it has set itself is beyond its present strength, and that there is danger of it being borne down by the might of an opposing impulse (as, for example, an appetite which long indulgence has made strong), can spend part of its strength in summoning to its aid another motive whose tendency is opposed to that of the too powerful appetite.

It can do, in fact, a precisely similar thing to what is done when the assistance of natural forces (as those of wind or steam) is called in to aid in resisting other forces of nature by which men's existence is threatened.

Thus, a sense of self-respect, a regard for general opinion, or a thought of the distress which indulgence may bring upon others, may be called in by love of duty to aid in opposing the appetite in question, and the combined force of these motives may be sufficient to withstand the temptation which would have proved too much for love of duty had it stood alone.

On the principle stated above that motives are strengthened by the acts they give rise to, the resulting conquest in the case just given will weaken the force of the appetite and increase in the same proportion that of its conquerors. The strength which accrues to the moral motive will be less of course than what it might have gained if it had been strong enough to accomplish the whole task for itself. It will nevertheless have made a definite advance, whereas, if it had risked an encounter single-handed, it might have been worsted, and as an inevitable consequence weakened—part of its strength being taken from it and made over to the conquering appetite.

We see, then, from this example what is the general nature of the service which other motives can render to the moral motive or love of duty. They have it in their power to assist in its progress and development by equalising its work to its capacity. Their help is equivalent, in fact, to the postponement of part of a too difficult task to a more convenient season. They take to themselves part of the force which the moral motive is attempting to resist, and their value is greatest when the part thus taken is the amount precisely by which the task of duty was before in excess of its power.

If *more* than this be taken, the love of duty will perform less work than it might otherwise have done, and the time of its complete ascendancy will therefore be needlessly postponed.

If *less* than this be taken, the love of duty will sustain a defeat; part of its strength will pass from it to its conqueror; the sum total of force to be resisted and overcome in the future will be to the same extent increased, and the period which must elapse before perfection is finally reached will consequently be still further prolonged.

Moral progress, therefore, is seen to proceed by a series of compromises, and it is as the means of effecting these compromises that the motives, which as opposed to love of duty we may call "non-moral," are to be valued. Their goodness is founded on man's moral infirmity, which obliges him to have recourse to aids and means in the attempt to subdue the lower impulses of his nature. Too weak to mount at once to the supreme control of life, the love of duty "stoops to conquer," and avails itself of the assistance of inferior motives in proportion to the greatness of its need. As this need must be ever varying according to the amount of success or defeat before sustained, it follows that the "non-moral" motives can have no fixed and absolute value, but must always depend in the last resort upon conditions of time and place.

They have that passing value only which belongs to forms and systems of government, and it is as incorrect to attribute *absolute* moral worth to any motive but the pure love of right and duty as it would be to speak of "absolute and immutable rights," and "the natural liberties of mankind," after the fashion of eighteenth century politicians.

It follows again from this that experience alone can be our guide when we would judge of the extent to which our regard for duty requires to be aided by inferior motives, and to it alone must we look for the means of determining the precise time and manner in which this assistance should be rendered.

From the history of past failures and successes we form a general idea of the degree of strength which should belong to

different motives in order to enable the work of moral development to proceed most rapidly, and we are guided by this in deciding what part of our nature to cultivate most assiduously. We remember, for example, that, when temptation would otherwise have proved too strong for our weak sense of duty to resist, we have been saved from falling by the timely aid of the affections. The thought of bringing misery on some loved one has held us back from sin when nothing else could have availed to save us, and henceforth we cultivate these affections, not only for their gracious influence in sweetening life, but that they may be ever at hand to lend their aid when similar temptations beset us.

And in the same way with regard to the various other motives by which men's conduct is governed, experience points out to us the circumstances and conditions under which they are best able to afford assistance to the moral motive. It shows that at certain stages of a man's life particular desires attain to a dangerous degree of power, and suggests the means by which they can most successfully be met, and their gradual subjugation by duty be ensured.

For example, the opponents which duty has most reason to fear in youth are the appetites and passions, and its first energies should therefore in most cases be given to the cultivation of what Hume has somewhat inappropriately termed the "calm passions". In later life, again, the moral motive finds itself assailed by quite another set of adversaries whose influence is even more to be dreaded. Avarice and selfishness are motives which commonly gain in strength as life advances. In youth they are seldom very dangerous, being held in check by the spontaneous action of other impulses; but in after years the moral motive has no more formidable adversary to contend with. The cultivation of the domestic and social affections by acts of kindness and thoughtfulness for others will commonly be found the most effectual means of meeting these foes of duty, and it is of the utmost importance that the attempt to repress them should not be deferred till the character has formed and hardened round them.

Thus we see that motives of every kind have a different value at different periods of life, and in exactly the same way with regard to the larger life of the race, we see that their relative importance varies from age to age according to the kind and amount of service that is required of them. In early barbarous times man's feeble sense of duty has to struggle with rude and debasing passions, and a regard for simple justice is seen to be of such essential service in aiding in this contest that it is not unnaturally taken to be the highest, and in some cases the sole,

motive having moral worth. It covers, in fact, almost the whole field of morals, and is even identified at times with the moral motive to which it renders such invaluable assistance.

Mercy, benevolence and charity are motives which come to be esteemed only in later times when this contest has been decided in favour of justice. The relation in which they stand to this latter motive in respect of moral progress is exactly similar to that in which a constitutional government stands to an unlimited despotism. They succeed to the position which justice held before, as the ally of the moral motive or love of duty, and will retain this position and continue to have moral worth ascribed to them until such time as duty shall have gained sufficient strength to stand alone and take upon itself the sole direction of life. As, in our present state of imperfection, we have never enough of these motives to aid the love of duty in its work of conquest, it is only natural that we should be apt at times to forget their true nature and look upon them as having an *absolute* moral worth of their own.

In reality, however, their value is *relative* and *temporary* only, just as is that of the constitutional government to which I have compared them, and it will necessarily become less and less as the state of final perfection is approached. Our sense of duty requires aids by reason only of its weakness, and accordingly as it gains in strength, the value of such aids—whether supplied by ourselves or others—must, *pari passu*, be diminishing.

I say "whether supplied by ourselves or others," because it is obvious that the work of adjusting and combining the "non-moral" motives to aid in the development of the moral motive is one in which men have the power to render valuable assistance to one another.

The value of every human institution rests ultimately on the power which men possess of calling out motives in others as well as in themselves, and on the fact that increased effect is given to this power by the co-operation which institutions imply. Co-operation and "division of labour," it is important to bear in mind, are of no less importance in their moral than in their industrial aspect. Just as, in order to bring about the particular combination of natural forces which is needed for some industrial process, men are accustomed to unite their powers and thereby act with almost indefinitely greater effect, so—in the similar work of combining motives in order to enable the love of duty to raise itself to the position which of right belongs to it—it is of the utmost importance that men should not isolate their efforts and work each for himself, but that their united powers should be directed to the common progress and development of all.

It is important that this point should be clearly understood, as it is here that the theory I am advocating differs most essentially from another which in some respects it resembles.

It has not unfrequently been maintained that the moral quality of an act must be judged of by its effect on the inward motives and dispositions which make up a man's character; but in proceeding to apply this test it has been common to limit the attention to the particular motive or set of motives which prompted the act in question. This, however, is far too narrow a view to enable us to give a correct and decisive judgment. So long as any man's sense of duty stands in need of assistance from without, and has not sufficient strength to do its work alone; so long as mutual aid remains a thing to be hoped for, and mutual injury a thing to be feared—so long will it be necessary, in judging of the quality of an act, to take account of other things besides its effect on the agent. The strengthening in him of the motives which led him to act is always a point to be considered, but it is in no case the only point, and is in fact but one of many consequences, all of which must be allowed to have their due degree of influence when the final judgment has to be given. To take a simple example which will bring out my meaning more clearly, let us suppose that a man has contributed to a charity from selfish motives, such as a desire to stand well with his neighbours or to gain a reputation for philanthropy. How, on the principles I have just been laying down, is the morality of such an act to be judged of? As far as the man himself is concerned it is plain that no good result whatever can be expected to follow. On the contrary, having yielded to a selfish and worldly motive, he has strengthened its hold upon him for the future, and has made selfishness more than ever a part of his nature. The work which his sense of duty has to accomplish is thereby increased, and the time of its fulfilment deferred, and it may seem therefore as though we have no choice but to condemn his act as altogether bad.

It has, however, another set of consequences which we must not omit to notice, and which may be found to give it an entirely different complexion.

The money he has thus unworthily given may be applied to purposes which will make it easier for others to withstand temptation and enable *their* love of duty to develop itself at a rate which would otherwise have been impossible. Extreme poverty implies an amount of temptation which duty must always find it hard to overcome, and the good which is done by the gift in lessening this resistance and averting the risk of failure may more than outweigh the harm which is sustained by the moral character of the giver. In short, it is the increase or diminu-

tion of the sum total of love of duty which exists in the world that we must in all cases look to as our test of the moral value of actions, and it will not do to limit our inquiry to the immediate effect upon the agent.

So far as the agent is concerned, that act is of course best which is prompted solely by a regard for duty, as the strength of this motive is thereby directly increased. But, just as we have seen that acts prompted by bad motives may yet be pronounced good rather than bad upon the whole, so, on the other hand, acts prompted by pure desire of right may have to be condemned as bad in view of their general consequences; for the increased strength which love of duty has gained in one quarter may be less than the amount by which it has indirectly been diminished in another.

Thus a conscientious persecutor may cut off by his misdirected zeal for duty a life which was being guided by this motive no less than his own, and which was aiding besides by its example and influence in uplifting thousands to the purity it had itself attained.

The moral value of actions, again, will often have to be determined by results which will appear exceedingly remote. Thus, a certain amount of physical exercise may be held to be morally desirable because it leads to increase of strength and vitality, which again make it easier for love of duty to accomplish its appointed task. Everything, again, that tends to preserve life is *primâ facie* to be valued, as it is life alone and the power of acting implied in it which affords the opportunity for the moral faculty to develop itself. I say *primâ facie*, because I do not hold that life itself is always a thing to be valued and held in reverence. Its worth depends in all cases on the use that is made of it, and if this is base and unworthy—if instead of leading to increase of moral power, it is so employed as to extinguish this power or lessen the influence which it before possessed—I maintain that life is a curse and not a blessing to the world. We rejoice when a new life comes into the world, because we know what infinite hopes and possibilities lie within it, but when the tenor of this life is disclosed and is seen to be opposed to moral progress, the reason for our rejoicing is taken away, and we rightly esteem it no longer. Life, in short, is only a *means*, just as all other things are means except the righteous will of Him who made them, and the love of duty which is its reflection in men's minds; and to secure the sole dominion of this will over the whole field of action should be the ultimate end and object of all human endeavour.

And as we plainly have not strength to shake off at once the influence of inferior motives and guide our life by conformity to

this will alone, we must be content to mount by degrees and to make use of means and aids when our reason tells us that we cannot rise without them. These means consist chiefly, as was before remarked, in the regulation and adjustment of the "non-moral" motives by the moral. If skilfully employed and brought forward at the right moment and in the right degree of strength, the work of overcoming the former and mounting by their aid will be comparatively short and easy, and the final triumph of the divine over the human element of man's nature may be looked upon as assured.

If, on the other hand, no such proper order is observed—if the love of duty has no definite aim and plan for its development, but rushes madly at temptation whenever it meets it—if, without making use of the means and aids which lie around it, it attempts what is clearly beyond its strength—it may postpone indefinitely the day of its final triumph, and even render it doubtful whether such a day will ever come at all.

The course of men's moral progress, in fact, lies midway between two extremes. On the one hand, as every time he yields to inferior motives he strengthens them, and so puts off the time of their final subjugation by duty, their assistance should never be called in except when there is absolute need for it. Every needless resort to them has the effect of postponing the arrival of perfection. It implies that two or more acts are done when one would have been enough, and is therefore directly opposed to what may be called the first principle of moral economy.

For example, when love of duty and self-interest have combined to produce an act, the strength gained by the former motive will obviously be less than it would have been had duty been the sole impelling motive. Self-interest itself will remain to be struggled with and overcome, and it will be all the more formidable as an adversary of duty from the strength which it has gained as its ally.

The other and opposite danger which we have to avoid is that of attempting too much and imagining that our sense of duty can dispense at once with the aid of inferior motives. Just as some men are unduly impressed with a sense of their moral weakness, and are always casting about for other motives to back up and support their sense of right which they are afraid to trust alone, so in the opposite direction there are others who think that their sense of duty is above the need for such extrinsic aids, and who neglect in their haste to reach perfection the only means by which it can be attained.

They starve the affections and dwarf and impoverish their faculties in a vain attempt to exalt their moral nature and mount at once to a state of glorified perfection. The result of

this unnatural forcing soon, however, makes itself apparent when temptations and difficulties have to be faced, and such men will not unfrequently be found to have failed in the end for want of those very qualities which their zeal for perfection had taught them to despise.

These then are the two opposite dangers between which we have to steer our course. The ultimate effect of each is one and the same, and moral progress is almost equally retarded by them. Every fresh advance of knowledge is teaching us better how to avoid them. We learn gradually, and often as the result of bitter experience, how life can be made to yield the greatest increase of moral power, and how the opportunities of action which it affords can be turned to the best account.

We come to see that there is a value and use as means to perfection in many things which at first sight seem utterly purposeless, and we learn more and more, as time goes on, the changing conditions of time and place on which this value depends. We see that if rightly used there is a power for good in all created things, and that every motive and impulse of man's nature can be made to assist in the work of his final glorification, and in bringing about that state of things when love of right alone shall rule him.

To what purpose our moral energies are destined to be put if they shall ever have completed their present task and vanquished and subdued all inferior motives, we cannot even pretend to guess; but, if we believe that there is a real positive purpose underlying the work of the Deity in the universe, and that he is not merely engaged in removing difficulties of his own creation, it is only natural to hope that when we have brought our powers into harmony with his will we shall be allowed to employ them in the furtherance of his work.

THOMAS THORNELY.

V.—JEWISH MEDIÆVAL PHILOSOPHY AND SPINOZA.

THE ancient Jews cannot be said to have been a philosophic people. Their function in the world's history was religious rather than speculative, while philosophy was a later growth among them, and did not spring up till after the prophetic intuition had become dim, and the race had felt the influence of foreign surroundings. Despite their national exclusiveness, the Jews have always shown a wonderful power of assimilating the

conceptions of others.[1] They brought new ideas away with them from Egypt and from Babylon; and when Greek conquest along with Greek culture broke the outer wall of Judaism, and Jew met Greek in the market-place of Alexandria, Hebrew religion received a fresh impress from the spirit and methods of Athenian thought.

But the time was not yet ripe for a Judæo-Greek philosophy, and Philo's system was soon forgotten by his countrymen. The Jews had to be driven from their fatherland, and their temple had to be destroyed, before they could look on doctrine as taking the place of the old external bonds of national unity.[2] Moslem religion and power had to be founded before they both saw the necessity and had the opportunity of wedding their doctrine to speculation. The necessity was to defend their own against a rival system; the opportunity lay in the scientific movement introduced by the Caliph Almamun (reigned at Bagdad, 813-33), and the translations from Aristotle and Neo-platonic writers executed under his direction.[3] The Jews participated in this movement, and Aristotelianism neglected in the land of its birth was perpetuated by them and their Moslem rulers. Drawing from the same sources, and busied very much with the same questions, these two Semitic races carried on the work of philosophy together, till the sudden extinction of Arabic culture[4] left the Jews to follow out the results alone, and to hand them on to the Christian Scholastics.

Upon the Jewish thinkers three chief influences were at work: that of Aristotelianism, which soon became the predominant philosophy; that of Neo-platonism, which almost entirely moulded some systems, and left traces perhaps upon all; and that of the Hebrew Scriptures and the mass of traditional interpretation by which they were overlaid. According as one or other of these influences gained the ascendancy, Jewish philosophers[5] may be divided into schools.

[1] Cf. Eisler, *Vorlesungen über die jüdischen Philosophen des Mittelalters*, II. 2.

[2] Cf. Graetz, *Geschichte der Juden*, V. 155.

[3] For an account of these see Munk, *Mélanges de phil. juive et arabe*, pp. 313 ff.

[4] Cf. Renan, *Averroès et l' Averroïsme*, 3me éd., p. iii.

[5] Among them may be mentioned: Saadia (called in 928 to be Gaon or 'bearer of dignity' in the Jewish College at Sura in Babylonia), Ibn Bachja of Saragossa (11th century), notable for his defence of the divine unity, Ibn Daud (1110-80), in whom Peripateticism had already become supreme, Moses ben Maimun or Maimonides (born at Cordova, 1135, died in Egypt, 1204), called by Graetz the "intellectual king of Judaism," and Levi ben Gerson or Gersonides (1288-1340). The Neo-platonic influence is shown

It would of course be impossible to give a full account here of the problems they dealt with. But, as an attempt to reconcile the philosophic with the religious standpoint, much of the most important speculation of all the schools circled round the two questions: (1) What is the nature of God? or, how are we to harmonise the notional unity of Greek philosophy with the personal unity of the God of the Jews? (2) What is God's relation to the world—Is He its transcendent cause, or immanent essence, or the source from which it emanates? and how can the doctrines of the philosophers on these points be made to agree with the Biblical history of the Creation? To these two questions the different schools of thought gave varying answers.

On both of them the progress of thought manifested by the Aristotelian and Neo-platonic schools tended to a fuller appreciation of Greek speculation, and an emptier conception of Jewish religion. And though a modern Jew thinks that the Aristotelian philosophy acted "like a refreshing morning wind, cooling the close and sultry atmosphere of faith,"[1] the boasted reconciliation of the two forces was only brought about by the reduction of one of them to the other, and it need hardly be said that it was not philosophy that gave way.

(1) The most striking example of this reduction of Judaism to philosophy is shown in the treatment of the divine attributes. Not only the Peripatetic school but those also who may be classed as Neo-platonists agreed in denying that the attributes ascribed to God even by the sacred writers really belonged to Him. This denial of the attributes, which is of Alexandrian origin and has been traced to the Book of Wisdom,[2] found its fullest development in the doctrine of "negative attributes" borrowed by Maimonides from Ibn Sina.[3] Certain qualities

most plainly by Ibn Gebirol of Malaga (born 1021), the Avicebron of the Scholastics, by Ibn Zaddik of Cordova (1080-1148), and by Abraham Ibn Esra (1088-1167), the Biblical commentator, as well as by the authors of the *Sohar* and other Kabbalistic works. The ruling philosophies were criticised from an orthodox point of view by Jehuda Halevi of Old Castile (born 1086), and by Don Chasdai Creskas of Saragossa (1340-1410), with whom and his pupil, Joseph Albo (1380-1440), Jewish mediæval philosophy may almost be said to close.

[1] Sachs, *Religiöse Poesie der Juden in Spanien*, p. 188.

[2] Munk, *Mélanges*, p. 465.

[3] Cf. Weil, *Phil. religieuse de Lévi-ben-Gerson*, p. 199. Maimonides's doctrine of the attributes was opposed by Gersonides (*Ibid.* pp. 121 ff., 202 ff.). In other respects, however, the latter adopted the theories of the Arabian Aristotelians to a greater extent than any previous Jewish thinker. Cf. the points mentioned by Munk, *Mél.*, pp. 318-9, with Weil, *Phil. rel.*, pp. 230 ff., 114, and 35 ff. Gersonides maintained the eternity of matter, and limited the knowledge of God to genera, but rejected the Averroïstic doctrine of the active intellect.

called the essential attributes had held a doubtful place in earlier systems. "God," says Saadia, "has assured us by His prophets that He is one, living, powerful, and wise,"[1] though these qualities are not distinguishable from His essence which is only known to us in its unity.[2] But Maimonides argues that, by asserting qualities essential to God's nature and existence, we deny His unity, while, by asserting qualities not necessary to His existence, we deny His immutability.[3] God, he contends, is indefinable because not composed of genus and difference, and "there can be no true relations between God and His creatures, since the characteristic of two notions in relation is complete reciprocity."[4] All predicates applied to the Deity are thus but so many ways of expressing what we do *not* know of Him; and "the true way of denoting God is by the negative attributes which can communicate nothing as to the nature of their object."[5] We cannot affirm a perfection, we can only deny an imperfection. All we can know of God is His necessary existence. "This," says Kaufmann,[6] "is the beginning and end of Maimonides's theology." His altar is erected *ἀγνώστῳ θεῷ*.

The personal God of the Jews is thus reduced to the unreal abstraction of indeterminate and indeterminable being, and the *νοῦς ποιητικός* or higher intellect of man, which, according to Maimonides, has for its object the knowledge of God,[7] is yet unable to apply to Him any of those categories which alone render cognition possible. This idea of God—Neo-platonic in nature and in its historical origin—is, however, not without relation to the Jewish creed; and the divine unity taught by the latter had only to be accentuated in an abstract one-sided way to result in a denial of the divine attributes.

The tendency of the Christian Schoolmen was to follow an opposite but scarcely more satisfactory course. Developing in an uncritical manner the fuller conception of God furnished by their religion, they avoided the empty abstraction of qualityless Being only to land themselves among the contradictions of a God defined as the most real being and substratum of all positive attributes. Spinoza's view of God is related both to the Chris-

[1] Eisler, *Vorl.* I. 7; Kaufmann, *Gesch. d. Attributenlehre in der jüd. Religionsphil. des Mittelalters*, 1877, p. 15.

[2] Kaufmann, *Gesch. d. Attr.*, p. 29.

[3] Cf. Franck, *Dict. des sciences phil.*, 2me éd., p. 1032a.

[4] *Moreh Nebuchim*, I. 52., Buxtorf's Latin transl., p. 81; cf. Kaufmann, *Gesch. d. Attr.*, p. 388; Eisler, *Vorl.* II. 43.

[5] Kaufmann, *Gesch. d. Attr.*, pp. 429-30.

[6] *Ibid.*, p. 471; cf. Eisler, *Vorl.* II. 46.

[7] Cf. Franck, *Dict.*, p. 999 b.

tian and to the Jewish idea. With the former he defines God as possessed of infinite attributes[1]; with the latter he rejects all ascription to Him of human or other qualities which exist in a determinate manner and therefore partake of negation.

It was against this denial of the attributes that Creskas directed his criticism, arguing that, though the attributes of God do not exist in Him as many, He is not a mere qualityless Being, since notional plurality is not inconsistent with real unity.[2]

(2) With regard also to God's relation to the world, Creskas attacked the positions of the other two schools. Though almost all the Jewish philosophers admitted the doctrine of creation *ex nihilo*, the admission was made rather out of compliment to faith than as a result of speculation. The views of Maimonides on the subject are essentially Aristotelian, although he not only admits this doctrine but also introduces Neo-platonic elements into his system. The Deity, according to him, is separated from the universe[3] as well as from human cognition, and though not Himself in contact with the sphere of the heavens, is yet "the author and cause of the first intelligence that moves the first sphere".[4] God, he holds, is the world's transcendent cause.

On the other hand both Ibn Gebirol and the Kabbalists substitute an emanational doctrine for this theory of transcendence. In Gebirol's system, the supreme being with its essential attribute,[5] the Divine Will or Creative Word,[6] first produces the simple substances[7]—universal matter and form,[8] universal intellect compounded of these, the three universal souls (intelligent, vital, and animal), and nature, the lowest of these simple substances, a force above the corporeal world, producing and governing it.[9] According to the Kabbala again, the qualityless En-soph or Infinite first manifests itself in the macrocosm or Adam Kadmon (the protoplast of the universe)—which, like Ibn Gebirol's 'nature,' has been compared to the 'natura naturans' of Spinoza, and from which proceeds the world of emanation with its ten potencies or Sephiroth, and thence the three worlds of creation, formation, and making, of which the human soul partakes.[10]

Against these Kabbalistic hypostases as well as against Peripate-

[1] *Eth.* I. def. 6. [2] Joël, *Don Chasdai Creskas*, p. 31.

[3] *Moreh*, I. 72., p. 147.

[4] *Moreh*, II. 4, p. 197; cf. I. 72, pp. 141, 145-7.

[5] *Extraits de la Source de Vie*, V. 67 (translated by Munk, *Mél.*, pp. 6-148).

[6] *Ibid.*, I. 3. [7] *Ibid.*, III. 3. [8] *Ibid.*, III. 21.

[9] Munk, *Mél.*, p. 228.

[10] Cf. Franck, *Dict.*, p. 852a, Munk, *Mél.*, pp. 492 ff.; Graetz, *Gesch. d. Juden*, VII. 78 ff.

tic abstractions, Creskas attempts a critical defence of the orthodox view, upholding the doctrine of the creation of the world and of its constant dependence on God.[1] Whether the creation took place in time or was from all eternity is, he holds, a matter of secondary importance. The point to be emphasised is the divine creative activity, not the period of its exercise,[2] though "the full truth is the traditional that God created at a definite time".[3]

The different doctrines of God and His relation to the world held by the various Jewish schools of thought are now apparent. The Aristotelian or leading school denied the divine attributes, and looked upon God as the world's transcendent cause. The thinkers more influenced by Neo-platonism also denied the divine attributes, but regarded all that exists as proceeding from the primal source by a series of emanations. The critical or reactionary school—at any rate, as represented by Creskas—affirmed the existence of attributes in the Deity, and, while asserting the absolute creation of the world, held that God is in all its parts bearing and sustaining it.[4] With each of these schools Spinoza's system has been, at one time or another, brought into connexion; but there were influences at work on the Jew of Amsterdam which gave his thought a different cast from theirs.

The Jewish philosophy of the middle ages had at least one point in common with the whole of mediæval thought. It was a scholastic rather than an original system; its problem was given to it from without, not worked out by it from within. But Spinoza is the determined foe of the scholastic presuppositions both of Jews and Christians, and in him philosophy, banished from the synagogue without being admitted into the church, seeks an independent footing in thought.

Spinoza was thus in a radically different position from that of his Jewish predecessors. Their problem was to reconcile the philosophy of the schools with the creed of the synagogue; but his task was a different one. What might have been the case had the Rabbinical college dealt otherwise with him, or had he been easier to deal with, we cannot tell. But the ban that cut him off from his people placed him at the head of modern philosophy. He rid himself of the presuppositions of Rabbinical tradition, as Descartes had rejected the assumptions of Christian Scholasticism—and for the same reason: he would accept nothing as true which he could not clearly and distinctly see to be true. He assimilated the Cartesian philosophy, removed its inconsistencies, and resolved its dualism into a higher unity.[5]

[1] Joël, *Creskas*, p. 24. [2] *Ibid.*, p. 67. [3] *Ibid.*, p. 70. [4] *Ibid.*, p. 24.
[5] Cf. Hegel, *Gesch. d. Phil.* iii. 411: "Spinozismus ist Vollendung des Cartesianismus".

But this view of Spinoza's philosophy as an original advance on lines laid down by Descartes has been by no means the only theory of the historical origin of his thought. Already, in his own century, a critic spoke of his system as having "arisen from the Jewish, though neither quite at one with it nor very different from it;"[1] and, within recent years, the attempt has again been made to trace his philosophy to Hebrew sources. It is worthy of note, however, that, whereas he was formerly spoken of as a pupil of the Kabbala, modern critics seek to affiliate him to Creskas and his Aristotelian opponents. And circumstances have of late arisen which have been thought to favour this opinion.

On the one hand, the recent important researches into Jewish mediæval philosophy carried out by Munk, Joël, Graetz, Eisler and Kaufmann have brought into notice many points of similarity to Spinozistic doctrines previously unknown. On the other hand, the discovery and publication in 1862 of a lost treatise of Spinoza's—the *Tractatus brevis de Deo et homine ejusque felicitate*—has cast a new light on the growth of his philosophy. In the *Ethica* we must, so to speak, read his system, as he says reason regards its objects, "sub quadam aeternitatis specie"; but from the *Tractatus brevis* we are enabled to some extent to see how it gradually arose in the mind of its author.

From the development of thought exhibited by this treatise, and from his own intimate acquaintance with the literature of his people, Dr. Joël of Breslau has attempted to show that the impulse for Spinoza to transcend Cartesianism and the material for the new metaphysical system he formed were received from his Jewish predecessors.[2] The same view is adopted by Dr. Ginsberg,[3] Spinoza's most recent editor, and has of late begun to be talked of as a point established. It may be worth while, therefore, to examine the grounds on which it rests.

There can be no doubt of the importance of the *Tractatus brevis* for tracing the historical sources of Spinoza's thought. It is, in all probability, the earliest at any rate of his esoteric works that we possess, and it covers the same ground as the later *Ethica*. A comparison of these two works shows that they agree

[1] J. G. Wachter, *Der Spinozismus im Jüdenthumb* (1699), part III. p. 2.

[2] Joël, *Zur Genesis der Lehre Spinoza's mit besonderer Berücksichtigung des kurzen Tractats* (1871), pp. 2-5; *Don Chasdai Creskas' religionsphilosophische Lehren in ihrem geschichtlichen Einflusse dargestellt* (1866), pp. 71-5. In the collected edition of these and other papers, by Dr. Joël (*Beiträge zur Gesch. d. Phil.*, 2 vols., Breslau, 1876) the paging of the separate issues is retained.

[3] *Ethik des Spinoza, im Urtexte*, Einl. pp. 31, 37. A brief statement of some of Dr. Joël's positions is given in Mr. F. Pollock's article, "Notes on the Philosophy of Spinoza," MIND X.

both in the premisses on which they build and in their ultimate conclusions, and that their differences are such as might naturally be looked for between the first statement of a new philosophy and its matured expression. Both show that Spinoza was working on Cartesian lines, but in both he has already adopted the distinctive points of his own theory. The definition of God and His necessary existence, the impossibility of there being two substances of the same kind, or of one substance producing another—the propositions from which the leading conclusions of his system necessarily follow,—as well as his distinctive ethical positions of good and evil as mere *entia rationis,* and of the strict determinism of the will;—all these points which we rightly look upon as marking off the Spinozistic philosophy from the Cartesian are already found in the *Tractatus brevis.* It differs from the *Ethica* less in the propositions proved than in the proofs it gives for them.[1] The earlier work is more concerned in defending its positions dialectically against ordinary or opposed views, while it is the chief aim of the later exposition to bring every particular doctrine to the unity of system, and to make each proposition depend by strict deduction on what precedes, leaving all necessary references to other theories to be dealt with in scholia or appendices. The mathematical method is almost foreign to the one treatise; the other is an "ethica ordine geometrico demonstrata," in which Spinoza discusses God and the human mind, the nature and strength of the affections, and the actions and desires of men "just as if the question were of lines, planes or solids".[2]

But, although the two works differ in no important point of doctrine, the development and application of the new theories adopted are less consistently carried out in the earlier and shorter discussion. And while every trace of hesitation or inconsistency has disappeared from the *Ethica,* statements irreconcilable with its fundamental positions may still be found in the preliminary sketch.

Were the theory of Dr. Joël and others correct, we might expect these points of divergence between the two works to betray the Jewish origin of Spinoza's thought. But it is not so. For in the *Tractatus brevis* he is nearer Descartes than he is in the *Ethica,* as will be made apparent by considering the chief points in which the two expositions differ.[3]

[1] Contrast *Tract. brevis,* I. 1 with *Eth.* I. 12, and *Tr. br.,* I. 2 with *Eth.,* I. 6; cf. Trendelenburg, *Hist. Beiträge zur Phil.,* III., 314, 357.

[2] *Eth.* III. praef., ed. Ginsberg, p. 161.

[3] These points are mentioned by Sigwart, *Spinoza's neuentdeckter Tractat* (1866), p. 96, and by Trendelenburg, *Beiträge,* III. (1867), p. 361.

(*a*) If in the *Tractatus brevis*, he speaks of mind and body as acting on one another,[1] whereas, in the *Ethica*, they are shown to be completely distinct from, though they completely correspond with, each other,[2] it is because he has not yet got rid of Descartes' conception of the soul as moving the animal spirits from its seat in the pineal gland.[3] (*b*) And if in the former work he still seems to regard knowledge as passive,[4] though he afterwards identified action and intellectual cognition,[5] this is but the obverse side of the same theory, according to which the soul is not only able to produce or direct the motion of the animal spirits, but is also the recipient of impressions from without.[6] (*c*) If, lastly, the doctrine of final causes has left its traces in more than the language of the *Short Treatise*,[7] and the "ens summe perfectum" [8] has not yet yielded its place to the "ens absolute infinitum," [9] it is because the exclusion of the conception of ends, not only from physics, as had been done by Descartes, but from philosophy altogether, has not yet been fully carried out.

But in all these points Spinoza's thought has already implicitly adopted the advanced position, to which Descartes himself may be said to have shown the way. (*a*) The complete correspondence of idea and reality, as already stated in the *Tractatus brevis*,[10] points beyond the theory of their interaction. For this latter hypothesis is utterly inconsistent with the view that extension and thought are the two attributes of the one substance, having nothing in common with each other,[11] and had only seemed defensible even to Descartes by an appeal to the omnipotence of God.[12] (*b*) But if mind cannot act on body in the production of motion, it may be shown in the same way that body cannot act on mind by the production of thought. And Dr. Joël has

[1] *Tr. br.*, II. 19. [2] *Eth.*, III. 2, II. 7.

[3] Descartes, *De passionibus animae*, I. 34, 43, etc.

[4] *Tr. br.* II. 15, ed. Van Vloten (1862), p. 159, ed. Sigwart (1870), p. 99, II. 16, ed. Vloten, p. 167, ed. Sigwart, p. 105.

[5] *Eth* IV. 24, dem: "Nos eatenus tantummodo agimus, quatenus intelligimus."

[6] Descartes, *De pass.*, I. 34, 43, &c.; Spinoza, *Tr. br.*, II. 19, ed. Vloten, p. 185, ed. Sigwart, p. 117.

[7] See *Tr. br.* II. 24; cf. Trendelenburg, *Beiträge*, III. 365.

[8] See *Tr. br.*, I. 2, 4, 6; cf. Descartes, *Princ. phil.* I. 17, 18.

[9] *Eth.* I. def. 6; *Epist.* 64, ed. Ginsberg, p. 178; also *Ep.* 41: "perfectionem in τῷ *esse* et imperfectionem in privatione τοῦ esse consistere; cf. Trendelenburg, *Beiträge*, III. 327, II. 50.

[10] *Tr. br.*, II. 20, n.3.

[11] *Tr. br.* II. 20, ed. Vloten, p. 197, ed. Sigwart, p. 125.

[12] Cf. *Med.* vi. p. 45; *Resp. Sextae*, pp. 166-7 (ed. of 1663).

drawn attention to a passage in the *Tractatus brevis*,[1] in which Spinoza anticipates his later theory of the activity of intellect. Joël,[2] indeed, seeks to explain the description of intellect as 'passio,' by a reference to Creskas. But the reference is altogether superfluous. For in the passages in which Spinoza speaks of intellect as passive, he is following the doctrine of Descartes,[3] and when he looks upon it as active, he is still indebted for his theory, and even for his language, not indeed to Descartes, but to a Cartesian manual.[4] (*c*) Lastly, the doubt that Descartes had cast on the teleological view of man as the final end of creation leads even in the *Tractatus brevis*[5] to the separation of the ends of nature from the ends of man, and to the denial of any final cause outside the divine laws, and results in the *Ethica*[6] in Spinoza's discarding from philosophy altogether the notion of final cause which Descartes had banished from physical science as "plane ridiculum et ineptum".[7]

A point in the *Tractatus brevis* to which attention has been drawn is the prominence given to the notion of Nature; and Prof. Sigwart has expressed the opinion[8] that not only does it "appear as an independent point of departure beside the notions of God and substance," but that "in the development of the treatise . . . the proposition 'God is the one substance' proceeds first from this 'Nature is God'."

But while this notion is certainly more conspicuous in the *Tractatus brevis* than in the *Ethica*, it does not occur in the first letter to Oldenburg (1661), the earliest of Spinoza's writings on the subject of whose date we can be certain. Yet from the

[1] I. 2. ed. Vloten, p. 33, ed. Sigwart, p. 23.

[2] *Zur Genesis der Lehre Spinoza's* (1871), p. 62.

[3] *De pass.*, I. 17, where the term "passiones" is applied to "omnes species perceptionum sive cognitionum quae in nobis reperiuntur".

[4] As I have not seen this fact noticed in any discussion on the subject, it may be well to quote the passages referred to. In *Tr. br.*; I. 2, Spinoza speaks of "the intellect which, as the philosophers say, is *a cause of its own conceptions*," and, being a "causa immanens," has not the imperfection of passivity. In Adrian Heereboord's Ἑρμηνεία *Logica* (on which, as Trendelenburg has shown, the discussion in *Tr. br.* I. 3 is founded), Lib. I., c.xvii., ed. 4, 1660, p. 117, "causa immanens" is defined as that "quae producit effectum in se ipsâ. *Sic dicitur intellectus causa suorum conceptuum*". Cf. F. Burgersdicii, *Institutiones Log.* (1626) Lib. I., c.xvii, p. 89: "At cùm anima nostra intelligit, aut appetit aliquid, *dicitur causa immanens suorum conceptuum*, aut affectuum, quos intelligendo et appetendo format." Heereboord, it may be noticed, also so far agrees with the Cartesian position as to speak of intellect as in a sense passive: "Intelligere est quoddam pati".—*Meletemata phil.*, ed. ultima, 1665, I. 169a.

[5] II. 24, ed. Vloten, p. 215, ed. Sigwart, pp. 136-7.

[6] I. App. [7] *Princ.* III. 3; cf. I. 28.

[8] *Spinoza's neuentdeckter Tractat*, p. 17.

three propositions[1] laid down in that letter, and afterwards placed first in the second chapter of the *Tractatus brevis*, coupled, as the writer says they are to be coupled, with the definition and existence of God—the burden of the first chapter of the same treatise—the conclusion is obvious enough that no substance can exist outside of God, that He is the one substance. And this is proved without the intervention of the notion 'nature'. It is true that 'nature' enters in the next proposition of the *Tractatus brevis*[2] apparently as an independent notion, not so much deduced from 'substance' or 'God' as an expression for the totality of the real with which the one substance must be identified. But it is only in the first dialogue,[3] too uncertain in date and relation to the rest of the treatise to serve as the foundation of an argument, that the unity and infinity of nature seem to be established on an independent basis. So far as the main line of reasoning is concerned, 'nature' holds a secondary rather than a primary place.

Admitting, however, its independence in Spinoza's thought, and the importance of its identification with the notion of God, we have still to ask whether it can be traced to Jewish sources. Spinoza has been supposed to be largely indebted to the Kabbala,[4] and Wachter tried almost to identify his system with the *Sha'ar Hashemaim* or *Porta Cœlorum* of Abraham de Herrera (Irira). But it is inexact to say that both regard God and nature as the same. That is true of Spinoza alone; for, in the Kabbala, nature is not the En-Soph, but proceeds from it by a series of emanations.[5] The source from which all things spring is not one of their number, nor all of them together, but infinitely above them all. In the Kabbala, God is the transcendent source of the emanations from which the world arises, whereas in Spinoza He is the immanent cause or essence of the universe.

It is true that, in one place,[6] Spinoza speaks of God as "causa emanativa," but Trendelenburg has shown that, throughout the whole discussion in which this expression occurs, he is referring

[1] The corresponding propositions of the *Ethica* are I. 5, 6, 8.

[2] I. 2, ed. Vloten, p. 23, ed. Sigwart, p. 16.

[3] Cf. Sigwart, *Spinoza's neu. Tr.*, pp. 17 ff., and German ed. of the *Tr. br.*, Prolegg, pp. xxxvii. ff. The latter of these passages seems in agreement with what is said above.

[4] J. G. Wachter, *Der Spinozismus im Jüdenthumb*, part III., p. 60; F. H. Jacobi, "Briefe über die Lehre des Spinoza," *Werke*, IV., i. p. 56.

[5] Cf. *Porta Cœlorum*, Latin transl., 1678, Diss. I., c. 4, §§ 8-16: "principium sine principio . . . non est Natura"; §§ 18-19: "omnia etiam emanasse ab Uno simplici et perfecto; et omnia ad unitatis naturam aspirare et agi."

[6] *Tr. br.* I. 3, ed. Vloten, p. 53, ed. Sigwart, p. 35.

at each step to Heereboord's *Logic*,[1] in which a "causa emanativa" is defined as that "a qua res immediate ac sine ulla actione media, emanant," and in which "non est causalitas distincta ab ejus existentia"—evidently the only sense in which such a phrase could be used by Spinoza.

It may be said, however, that the general *natura naturata* of Spinoza corresponds to the Adam Kadmon or primitive man, which, according to the Kabbala, is the first manifestation of the En-Soph. But the Adam Kadmon is one and individual, itself an emanation, and the source of all other emanations, whereas the general *natura naturata* of Spinoza consists of the modes (motion in matter, and intellect in thought) immediately and eternally depending on the divine attributes, the particular modifications of which are individual things.[2] This *natura naturata* is called in the *Tractatus brevis* the Son of God, His first effect and creature; and in the expression "filius Dei" there may indeed be a reference to Kabbalistic as well as to Neoplatonic or Christian ideas; but it is not like the Adam Kadmon set up as the macrocosm, to which the microcosm ought to assimilate.[3] In this, and in other passages,[4] it is true, Spinoza has not quite shaken off the traditional doctrine of creation; but it could not have been Kabbalistic influence that induced him to retain it, since it was the object of the Kabbala to substitute the notion of emanation in its stead.

It may indeed be the case that some of the anticipations[5] of isolated propositions in Spinoza to be found in the *Porta Cœlorum* or other such works were not without effect on his thought. But it is hard to believe that he derived much assistance from writers "at whose madness" he could "never wonder enough".[6] Their whole tone of thought is so entirely different, and their conceptions of the relation of God and the universe so widely divergent from his, that the theory of the Kabbalistic origin of Spinoza's philosophy is pronounced by Dr. Joël to be unhistorical, and has now for the most part been relinquished.[7] And as regards his doctrine of nature, we have Spinoza's own account of its source, in which he refers to

[1] Ἑρμηνεία *Logica*, I. 17, p. 114.

[2] *Tr. br.* I. 8, 9. [3] *Porta Cœlorum*, II. 1, § 9.

[4] Cf. *Tr. br.* I. 2 ed. Vloten, p. 23, ed. Sigwart, p. 15.

[5] In addition to the passages quoted by Wachter *(op. cit.*, pp. 94-5), cf. *Porta Cœlorum* II. 7 § 10 with *Eth.* I. 34 and App. Two of Wachter's quotations are also adduced by Graetz, *Gesch. d. Juden*, X. 181n.; cf. 183n.

[6] *Tract. theol.-pol.* c. 9, ed. Ginsberg, p. 116.

[7] *Creskas*, p. iv.; *Spinoza's theol.-pol. Tractat auf seine Quellen geprüft* (1870), p. xi.

the Kabbala as yielding a support more doubtful than what he claimed from Paul and all the ancient philosophers.[1]

In this account Spinoza speaks as if, in his views on God and nature, he stood alone among modern thinkers, though he might have claimed the adherence of one who but a couple of generations before had discoursed of the "*Ἑν καὶ πᾶν*[2] which in after days attracted Lessing to Spinoza. It would be out of place here to ask whether the writings of Giordano Bruno may have come into Spinoza's hands and left their mark on his works, or to pass judgment on Professor Sigwart's careful and important investigation of the question, but the similarity of much of his philosophy to the better part of the Kabbalistic speculation and the influence which the Jewish Ibn Gebirol[3] exerted on his thought, bring his leading positions within the range of this paper.

Now Bruno and Spinoza agree with one another in a most important particular: both overcame the prevalent dualism of philosophy, and both overcame it in the same way—not by reducing one factor of the opposition to the other, but by resolving both into a higher unity. The dualism with which Bruno had to contend was that of matter and form, potentiality and actuality, corporeality and incorporeality, and he got beyond their opposition by pre-supposing a matter above the ordinary distinction of matter and form,[4] something common both to the sensible and to the intelligible world, and from which corporeal and mental substance spring as from a common root. This is his conception of Nature. "The whole is in substance one."[5]

But when Spinoza goes through a similar train of reasoning, we seem able to trace, in his different way of working, the new phase the old difficulties had received from the impress of Cartesian thought. Spinoza indeed speaks of body and mind as Bruno does of corporeal and incorporeal substance, for that is the way in which the dualism presents itself to the ordinary consciousness. But this dualism is not equivalent with him, as with Bruno, to that of matter and form, potentiality and reality; for he substitutes for body and mind the notions of extension

[1] *Epist.* 21: ". . . cum Paulo affirmo, et forte etiam cum omnibus antiquis philosophis, licet alio modo; *et auderem etiam dicere*, cum antiquis omnibus Hebraeis." Cf. *Eth.* II. 7, sch: "quod quidam Hebraeorum *quasi per nebulam* vidisse videntur".

[2] See the *De la causa*, &c., Dial. V. init., *Opere di Giordano Bruno Nolano*, I., pp. 280 ff., ed. Wagner, 1830.

[3] See especially the *De la causa*, Dial. III. and IV., *Op.* I. 251, 257, &c.

[4] *De la causa*, Dial. III., *Op.* I. 251, where Ibn Gebirol is quoted in support of the position adopted.

[5] *De la causa*, Dial. III. fin., *Op.* I. 264.

and thought, which, in Descartes, had formed the constitutive attributes of those two substances. And thus it happens that, in Bruno, corporeal and incorporeal substances still remain as substances, though only in a derived sense, being dependent on the world-reason which produces them, whereas, in Spinoza, body and mind, being reduced to the attributes extension and thought, are not dependent on the one substance in the sense of being produced by it, but constitute its essence. In Bruno, moreover, the two derived substances supplement one another as matter and form, and there is no hint of the Spinozistic doctrine of the complete parallelism but complete separation of extension and thought. The world-reason of Bruno, too, acts with design, whereas, in Spinoza, every trace of final cause is abolished with the possibility of the interaction of extension and thought. And we must not forget that at the head of Brunos's system, as in that of the Neo-platonists and of Ibn Gebirol, there stands above the world-reason a transcendent unspeakable God,[1] so that had this been the source of Spinoza's thought we might have expected a polemic against the unknowable entity, whose position in the philosophy of Bruno, though somewhat of a sinecure, is certainly an elevated one.

The impulse which drove Spinoza to seek for the unity of the unsolved dualism of Descartes may indeed have come from acquaintance with Bruno or with writings such as his. But there was much in Descartes himself to drive an independent thinker beyond Cartesianism. And however near Bruno may sometimes have come to Spinoza's positions, the style and manner of his thinking are so different from the latter's rigid logic, so much more akin to Neo-platonic and even Kabbalistic speculation, that one cannot help fearing that Spinoza would have attributed to the perfervid philosopher of Nola some share of the "insania" he found in the exponents of the Jewish Kabbala.

I am glad to be able to agree with Dr. Joël that the attempted derivation of Spinozism from the Kabbala is unhistorical, but when he himself turns to Maimonides and Gersonides, and to their acute critic Creskas, and seeks to find in them the material of Spinoza's thought, I cannot but think that he too often rests content with the discovery of superficial resemblances.

Dr. Joël compares Spinoza's idea of God with that of Maimonides, saying that the "former proves the unity of God exactly as Maimonides does".[2] But the fact is that, while Spinoza argues against compositeness of substance, Maimonides

[1] *De la causa*, Dial. II., *Op.* I. 233; cf. Dial. IV., *Op.* I. 275.

[2] *Zur Genesis der Lehre Spinoza's*, pp. 14, 19n.

attacks plurality of attributes. Both, it is true, hold that God is not in the likeness of any human personality.[1] But it is incorrect to speak of this position as if it were Spinoza's complete notion of God, for his theory has a positive side which that of Maimonides altogether wants. The former regards God as consisting of an infinity of attributes, two of which—extension and thought—are conceivable by our understanding, while, according to the latter, we can predicate nothing of God at all, lest in doing so we compromise His unity or immutability.

The theory of Maimonides is one of agnostic Deism, for he holds that God is not only separate from the world He has made,[2] but also inconceivable by the intellect of man,[3] whereas the God of Spinoza stands at the opposite pole of thought, at once identical with the universe,[4] and adequately cognised by the human mind.[5] With the former theory it is difficult to reconcile the doctrine of creation in time, but with the latter it is impossible to believe in creation at all. And had Dr. Joël[6] attended to the difference in their fundamental conceptions, he might have seen that Spinoza had not much in common here with his Jewish predecessors. For the difficulty the latter felt in the doctrine of a creation out of nothing, and the conclusion they arrived at, are quite distinct from Spinoza's position on the same question. They, regarding God as separate from the world, could not imagine how it was possible for Him to have brought into being at a definite time something that had nothing in common with Himself, and the tendency of their thought (as shown in Gersonides) was to pre-suppose a formless matter which had existed from all eternity. Spinoza, on the other hand, was so far from admitting an eternal substrate independent of God that he held there was no substantiality outside the divine essence, and thus could no longer speak of the creation of the universe, for the universe was shown to be God.

Again, we are told that Spinoza was indebted to Maimonides for his doctrine of good and evil.[7] But the similarity between the two views is by no means so great as may appear on the surface. Both, following the account of the Fall in *Genesis*, attribute to man in his perfect condition knowledge only of the true and false.[8] Both, too, regard *evil* as having merely a relative existence. But, according to Maimonides, it is a privation of

[1] Spinoza, *Eth.* I. 17, sch; Maimonides, *Moreh Nebuchim*, I. 52, tr. Buxtorf, p. 81.

[2] *Moreh*, I. 72, p. 147. [3] *Ibid.*, I. 52, &c. [4] *Eth.* I. 15.

[5] *Eth.* II. 47. [6] *Zur Genesis*, pp. 29 ff. [7] Joël, *Zur Genesis*, p. 45.

[8] *Moreh*, I. 2, p. 4; *Eth.* IV. 68.

the good or of existence (a theory common to many theologians from Augustine downwards), while, in Spinoza, *good* is equally relative with evil; the one means the useful, the other the hurtful.[1] The former theory rests on the metaphysical doctrine of the excellence of all that is, "for all existence," says Maimonides, "is good";[2] the latter founds the distinction on a psychological analysis, according to which "good and evil are nothing positive in things themselves".[3] In the one theory, evil may be called relative—*i.e.*, relative to something else that is good[4]; according to the other theory both good and evil are relative—relative, namely, to the desires of the man who calls them so. The one is an objective, the other a subjective distinction.

Maimonides and Gersonides may indeed have been in Spinoza's eye in discussing these and other questions.[5] But he is related to them as a critic, not as a follower. With Chasdai Creskas, however, he has at least one point in common—his antipathy to Aristotelianism,—and it is to that thinker especially that Dr. Joël fancies he can trace the impulses that "made Spinoza the founder of a new system *toto coelo* different from the Cartesian".[6]

Creskas is indeed quoted with approval by Spinoza[7] on account of having proved the existence of God without the assumption of the Aristotelians that an infinite regress of causes is unthinkable. He makes the remark too which Maimonides made before him, and Spinoza afterwards made,[8] that in the phrase "creation out of nothing," "nothing" is not to be regarded as the recipient of the divine creative act, but merely as the denial of anything that can be a recipient. And in another place, he uses Spinoza's example of the mathematical line to illustrate the true infinite: "as little as lines arise out of points, so little can infinite exten-

[1] *Éth.* IV. def. 1, 2; *Tr. br.*, I. 10, ed. Vloten, p. 85, ed. Sigwart, p. 55.

[2] *Moreh*, III. 10, p. 353. [3] *Eth.* IV. praef., ed. Ginsberg, p. 220.

[4] This is admitted by Dr. Joël, (*Creskas*, p. 42n), when he says that Maimonides held the "mere negativity" of evil. Maimonides also talks of evil as relative: "respective et comparative ad rem aliam" *(loc. cit.);* but his doctrine is perhaps best expressed by his words, "mala omnia esse privationes". Creskas maintains against Maimonides that evil proceeds from God by way of trial or punishment, having good for its end—a view sharply distinguished from Spinoza's by making the good absolute or real. "From God only the good proceeds which exhibits itself to the good as reward, to the bad as punishment."—Joël's *Creskas*, p. 43.

[5] For his argument against the supposed Aristotelian position that Divine Providence extends only to genera and not to individuals (*Tr. br.* I. 6, ed. Vloten, p. 69, ed. Sigwart, p. 46), he is probably indebted to Maimonides (*Moreh*, III. 18, pp. 384-5.) Cf. Trendelenburg, *Beiträge*, III. 395 (1867), Joël, *Zur Genesis*, p. 56 (1871).

[6] Joël, *Creskas*, p. 72. [7] *Epist.* 29.

[8] *Cog. met*, II. 10, ed. Paulus, p. 126.

sion be thought of as made up of parts placed together".[1] Again when Spinoza opposes Descartes' view that God might have created things other than they are,[2] he may have been consciously working along the lines of both Maimonides and Creskas, who maintain that what contradicts reason is impossible for God,[3] though he may also be regarded as taking a side in the Scholastic controversy as to whether intellect or will is supreme in the Deity, and may have been induced to reverse Descartes' position from Cartesian works that lay ready to hand.[4]

But Dr. Joël also holds that Spinoza borrowed from Creskas some of the most important parts of his system, such as his distinction between attributes and propria in the *Tractatus brevis*, his reference of extension to the nature of God, his denial of final causes and of the freedom of the will, and his theory of the intellectual love of God as the supreme end of man. Were all this established, such positions as the impossibility of one substance creating or producing another, and the doctrine of extension and thought as the two attributes (known to us) which constitute the essence of the one substance—certainly the leading points of Spinoza's metaphysics—as well as his whole psychological and practical theory[5] would still remain to be accounted for; so that even thus no justification would be given to the extreme statements sometimes made, as if Spinoza had merely thrown a philosophy borrowed from the Jews into the logical moulds of Descartes.[6] It would certainly show, however, that

[1] Joël, *Creskas*, pp. 21-2. We may also refer to Herrera (Irira), *Porta Coelorum*, III. 1, §§ 4, ff., in which the infinite "ratione quantitatis continuæ" is shown to be inapplicable to the first cause whose infinity is that of essence and perfection, of eternity and omnipresence. Descartes too distinguishes between the indefinite and the infinite, the latter only being applicable to God.—*Princ.*, I. 27.

[2] *Resp. Sextæ* (ed. of 1663), p. 160-1. Spinoza, *Cog. met.*, II. 9, p. 121, uses Descartes' example of the angles of a triangle.

[3] Joël, *Zur Genesis*, pp. 30, 50.

[4] Cf. Heereboord, *Mel. Phil.*, III. 314a: "Consequentur Deum non posse impossibilia, et tamen plura posse quam vult. Impossibilia diximus esse quae implicant contradictionem. . . . Talia sunt omnia, quae pugnant cum proprietatibus Dei, vel essentialibus vel personalibus, aut cum natura rerum."

[5] His treatment of the emotions is admittedly founded on Descartes, but Dr. Joël asserts that the distinction of the three kinds of knowledge was anticipated by Creskas *(Zur Genesis*, pp. 62n, 64-5.) But, *e.g.*, instead of Spinoza's intuitive cognition to which enjoyment belongs and which is different in kind from belief *(Tr. br.*, I. 2, called 'ratio' in *De int. em.* and *Eth.)*, Creskas has merely belief accompanied by a feeling of joy.

[6] Cf. Ginsberg, *Eth. d. Sp.*, Einl., p. 36: "Dieser Zusammenhang" between Spinoza and the Jewish philosophers "zeigt sich als ein so unmittelbarer und enger. . . . . dass die Probleme selbst durch das Studium der

Creskas played a very important part in the formation of Spinoza's thought, and furnished him not only with many of the chief problems of his philosophy, but also with the solutions of them. Whether Creskas really played that part, whether the alleged points of identity are anything more than superficial resemblances, will soon be made apparent.

In the *Tractatus brevis*, Spinoza draws an important and, for his theory, necessary distinction between the attributes of God (thought and extension), through which we cognise Him as He is, and not as working outside himself,[1] and mere 'propria' which may be ascribed to God either in relation to all His attributes (as that He is eternal, self-subsistent and infinite) or in relation to any one of His attributes (as that He is omniscient or omnipresent).[2] Dr. Joël tells us that "the same distinction" is to be found in Creskas, and quotes in support of his statement a somewhat obscure passage, in which the latter draws a distinction between what seem to be regarded as essential attributes—such as goodness or knowledge and infinite power,—and on the other hand, attributes due to mere "intellectual consideration," such as eternity denoting that God is not something that has become, or existence which denies His absence, or unity which opposes His compositeness or plurality.[3] The latter class seems to have most similarity with what were called "negative attributes" by the Jewish philosophers. But, at any rate, it cannot be identified, as Joël seeks to identify it, with Spinoza's 'propria'; for the latter include all the attributes of Creskas, and not merely a part of them, and the description of 'nominatio externa'[4] which Joël says[5] corresponds to the "intellectual consideration" of Creskas, really applies to the latter's essential as well as to his negative attributes. Creskas's distinction was an attempt to rescue certain predicates from the limbo of negation into which Maimonides had banished all the divine attributes; whereas, in Spinoza, the changed point of view which looked upon extension and thought as attributes of the one substance instead of as constituting the essence of body and mind respectively, necessarily introduced an entire change into the way of conceiving both substance and attributes. God must now be the only substance, and the attributes ordinarily ascribed to Him can no

jüdischen Philosophen des Mittelalters gegeben erscheinen und dass die Bekanntschaft mit den Schriften des Cartesius nur die Form und Anlage zu der wissenschaftlichen Darstellung gewährt."

[1] *Tr. br.*, I. 2, ed. Vloten, p. 35, ed. Sigwart, p. 24; cf. Descartes, *Princ.*, I. 56.

[2] *Tr. br.*, I. 7, n. 1, ed. Vloten, p. 73, ed. Sigwart, p. 48.

[3] *Zur Genesis*, pp. 19-20. [4] *Tr. br.*, I. 2. [5] *Zur Genesis*, p. 21.

longer be ranked as such, but must be regarded as in some sense modifications of extension and thought. Both the distinction itself and the motive for it are thus different in the two systems.

God, with Spinoza, is not different from extension as He is not different from thought. But it is in pursuance of quite another line of argument than his that a seeming ascription of extension to God is made by Creskas. "The ancients," he says,[1] "have also applied the name 'place' to the essence (form) of a thing, because it defines and limits the object both in its totality and in its parts. . . . And because God is the essence of all that exists, since He produces, defines, and limits it, therefore have the ancient doctors applied to Him the name *Makom* (place), expressing 'Praised be God' by 'Praised be Hamakom'. . . . And this is a truly beautiful comparison. For as the dimensions of the empty enter the dimensions of the bodily and its fulness, so is God in all parts of the world, is its place, for He sustains and upholds it." But Creskas never meant this as more than a comparison—a metaphorical expression for the omnipresence of God; and he holds along with it the doctrine of the creation of the world in time,[2] and "the origin of the corporeal from a form (a spiritual) in such a manner that the form bestows and brings forth something essentially unlike itself."[3] Surely Descartes himself could hardly say more than this, that the world is in essence unlike its Creator; and it is therefore somewhat strange to hear Dr. Joël asserting that it was Creskas who induced Spinoza "to give up the Cartesian thought of God having produced a substance entirely foreign to His essence".[4] Dr. Joël now[5] tells us indeed that he never meant to imply that Creskas spoke of extension as an attribute of God, and that according to that philosopher the similarity of essence between God and the world consists only in this, that "the world is good of its kind, and can therefore owe its origin to the source of the good".[6] But not only is this a similarity of essence (if it can be properly termed such) which Descartes himself would have admitted, and which cannot therefore have induced Spinoza to reject Cartesianism, but Creskas's view is also entirely outside the range of thought of Spinoza, according to whom the good does not belong to the essence of things at all—neither of God nor of the world—but only exists in the mind of man.

It is this same apparent oblivion to the radical difference between their notions of God that has led Dr. Joël to con-

[1] Joël, *Creskas*, pp. 24-5—a passage also quoted by Ginsberg in support of his theory.

[2] Joël, *Creskas*, p. 70. [3] *Ibid.*, p. 67, cf. p. 13. [4] *Ibid.*, p. 73.

[5] *Spinoza's Theol.-pol. Tractat*, p. v. [6] Joël, *Creskas*, p. 73.

found Creskas's doctrine of ends with Spinoza's denial of final causes.

Dr. Joël says that on this point Spinoza is in appearance nearer Maimonides than Creskas, though in reality he is more at one with the latter.[1] Maimonides admits the notion of ends because he believes in the origin of the world in time, and it is thus in argument rather than result that his similarity to Spinoza is to be sought. Now, there is no reason for denying that the latter may have derived assistance from the discussion in the *Moreh Nebuchim*, as well as from works nearer his own time.[2] Both Maimonides and Spinoza oppose the proposition that all things are made for man, and he to worship God. But the former attempts to refute it by dialectical arguments,[3] the latter chiefly by tracing it to its psychological origin.[4] And as Maimonides was looking for an external end of creation, Joël thinks that his views were of less importance for Spinoza's thought than those of Creskas, by whom this stand-point had been relinquished.[5]

It is certainly true that Creskas holds we cannot ask for an end of creation outside the creation itself. "God creates," he says, "because He is good, and He loves what He has created."[6] But to reject in this way external teleology is not tantamount to denying final cause. The ends of God are none the less His ends because they proceed from His very nature. "That God is good, and therefore willed to create," is Creskas's doctrine; but when Dr. Joël says that it means the same as this, which Spinoza might adopt, "That God is good, and therefore must create,"[7] exception may well be taken to the statement. For, to Spinoza, "God is good" means no more than that God in the fullest sense *is*, since moral attributes do not, strictly speaking, belong to Him; whereas moral goodness is, according to Creskas, an essential attribute of God.[8] The phrase has thus quite a different meaning for the one philosopher from what it has for the other; and for Spinoza creation has no longer any meaning whatever. He abolishes both final cause and creation, Creskas retains them both—*that* is the extent of their similarity.

[1] *Creskas*, p. 62; *Zur Genesis*, pp. 35, ff.

[2] Cf. *Eth.* I. App., p. 111: 'Et quamvis theologi, &c.,' with Heereboord, *Mel. Phil.* II. 296a.

[3] *Moreh*, III. 13, p. 364: "Absurdum maximum, quòd sc. omnia reliqua entia praeter hominem sine certo aliquo fine creata sint, cùm finis illorum, homo nempe, sine illis omnibus esse posset."

[4] *Eth.* I. App., p. 111. Nor has the argument on p. 111: "Hoc tamen adhuc addam, &c." any similarity to that of Maimonides.

[5] Joël, *Creskas*, p. 64. [6] *Ibid.*, p. 63. [7] *Ibid.*, p. 64.

[8] *Ibid.*, p. 36; *Zur Genesis*, p. 20n.

As of the theoretic doctrine of ends, so of its practical application. "The chief end of man is," according to Creskas, "the love of God without any regard to what lies outside this love"[1] —a doctrine which has been identified with the crowning point of Spinoza's system, the intellectual love to God. But the very intellectuality of this love makes Spinoza's theory essentially different from Creskas's. In the one love is constituted by knowledge, in the other cognition is but a means to the higher end of love.[2] Dr. Joël will have it indeed[3] that, in Spinoza's "amor intellectualis Dei," the "intellectualis" comes from Maimonides, and the "amor" from Creskas. But intellect *plus* love is a very different thing from intellectual love. Creskas placed the end of man in love, and held cognition to be merely a means to it; Maimonides placed it in intellect[4] to which moral qualities were strictly subordinate. And the one theory could not be adopted without rejecting the other, until Spinoza had first of all learned to identify intellect and love.

Nor, in Spinoza's system, can God return the love of man to Him as in Creskas's. The latter has a double point of view: that of man from which love is the only end, and that of God from which "the end of man is to be partaker of the good and of union with God, and consequently of the condition which makes this union lasting—the future life".[5] But for Spinoza there is only *one* point of view, and "the intellectual love of the mind to God is really a part of the infinite love wherewith God loves Himself;" and in this—not in any future life—"lies our salvation and blessedness and freedom".[6]

But one point more and we have done with Creskas. "In this treatise," says Dr. Joël, referring to the *Or Adonai*, "we have the first consistent attempt to lay the foundation of religion and morals, without the assumption that man is, in the full sense of the word, a freely-acting being—an attempt which, when made by Spinoza, excited so much wonder and opposition."[7] That Spinoza's doctrine provoked opposition is certainly true, but that it excited wonder except in the minds of the ignorant I was not aware; for since the days of the Stoics, half the schools of philosophy have accepted the theory of determinism. Creskas, it is

[1] Joël, *Creskas*, p. 61.

[2] Joël, *Creskas*, p. 60. [3] Joël, *Spinoza's Theol.-pol. Tr.*, pp. x, 46 ff.

[4] *Moreh* III. 54, where (p. 530) he quotes in support of his doctrine Jeremiah, ix. 24: "Let him that glorieth glory in this, that he understandeth and knoweth me, that I am the Lord".

[5] Joël, *Creskas*, p. 61.

[6] *Eth.* V. 36; cf. *Tr. br.* II. 24, ed. Vloten, p. 213, ed. Sigwart, p. 135.

[7] *Creskas*, p. 54.

true, departed from the traditions of his race in denying free-will, which had always been a leading point in Jewish systems. Gersonides, however, had found himself able to save it only by denying an individual providence; and Creskas, agreeing with his reasoning, was unable to avoid his conclusion without sacrificing human freedom in order to retain in their fulness divine foresight and predestination. But the theological basis on which he founds his doctrine differs from the reasons which led Spinoza to a similar result.[1] For the latter argues from the nature of volition itself, that, as existence does not belong to its essence, it must necessarily have a cause, and that in willing this or that particular thing we are moved by an external cause. Nor, he adds, can we escape this conclusion by saying that the will is the cause, since, apart from individual acts, will is a mere fiction or 'ens rationis' of which it is absurd to ask whether it is free or not.[2]

That Spinoza's view has also its theological aspect is of course self-evident.[3] But in his first attack on free-will, his arguments are founded on a psychological theory, and no attempt has been made to compare that theory with anything in Creskas. And when, on the other hand, he discusses the subject theologically, it is easy to see that he is simply carrying out the doctrine of predestination as stated by Descartes.[4] The latter had admitted that we cannot comprehend how the free-will of man can be harmonised with divine foreordination, and it was accordingly rejected by Spinoza as unable to stand the test of distinct thinking.[5]

But if the will is thus determined, how are we to defend the distribution of reward and punishment for actions which are really beyond the control of the individual? The answers of Creskas and Spinoza to this testing question are another means of showing whether their views on the will are the same or not? Dr. Joël compares the two answers as if they were identical in principle;[6] but they are really essentially different. Creskas says we might as well ask why one who comes too near the fire is burned, as why one who does wrong is punished; that is to say, the consequence is in both cases a result of the constitution

[1] This, as well as some of the previous arguments, is noticed by Sigwart in his edition of the *Tr. br.*, Proleg., p. xli. n. The difference between the determinism of Creskas and that of Spinoza is remarked on by Graetz, *Gesch. d. Juden*, VIII. 99n.

[2] *Tr. br.*, II. 16, ed. Vloten, pp. 161-7, ed. Sigwart, pp. 101-5; cf. II. 6, ed. Vloten, p. 67, ed. Sigwart, p. 45.

[3] Cf. Joël, *Spinoza's Theol.-pol. Tr.*, p. v.

[4] Cf. *Princ.*, I. 41. [5] Cf. *Ep.* 49.

[6] Joël, *Creskas*, p. 50; *Zur Genesis*, p. 60.

of things, or of the decree of God. Spinoza replies that it is as lawful to punish those who cannot subdue their passions as it is to exterminate venomous snakes, or to smother a man rabid from hydrophobia.[1] Punishment, that is, is justifiable because it is useful, because it promotes the common weal and benefits society. Creskas, following out his doctrine of the divine decree as extending to every individual occurrence, discovers in it the explanation of the consequences of actions as well as of the actions themselves; while Spinoza finds in their effects upon men not only the distinction between good and evil in conduct, but also the sufficient reason for rewarding the one and punishing the other. The whole thought of Creskas runs on different lines from that of Spinoza; the orthodox defender of Judaism has little in common with the anathematised outcast from the synagogue.

What the preceding discussion has shown in detail may now be summed up in a word. The Jewish mediæval thinkers differed from Spinoza both in the problem they had to deal with and in the solutions of it they offered. Theirs was a philosophy of reconciliation guided by the spirit of compromise; in him the movement of thought was impeded by nothing outside itself. His relation to them was as much one of antagonism as Descartes' relation to Christian Scholasticism, and indeed much more so; for Descartes remained to the last on good terms with the Church, whereas Spinoza began his career by breaking with the Synagogue. And it is scarcely possible to overlook the essential differences that separate the emanational theory of the Kabbala, the deistic conceptions of Rabbinical peripateticism, or the orthodox doctrines of Creskas, from what Solomon Maimon,[2] followed by Hegel,[3] called the acosmism of Spinoza.

W. R. Sorley.

[1] *Epist.* 25.

[2] *Lebensgeschichte*, I. 154, Berlin, 1792—quoted by Ginsberg.

[3] *Encykl.*, § 50, ed. Rosenkranz, p. 75; *Gesch. d. Phil.*, III. p. 373.

VI.—NOTES AND DISCUSSIONS.

MENTAL DEVELOPMENT IN CHILDREN.

The May number of the *Deutsche Rundschau* contains an interesting article by Prof. Preyer of Jena on "The mental development of man during the first years of life," which seems to be a continuation of studies on the early mental life of animals published in *Kosmos*. The writer, apparently in ignorance of Mr. Darwin's carefully made observations of infant mental life published in MIND VII., has gone to work in a scientific fashion, observing and comparing a number of infants.

Beginning with Movement, he maintains that the first cries of the infant are neither voluntary nor emotional, but "impulsive". The new born infant is, to use Virchow's expression, 'a spinal being,' wanting the inhibitory actions of the higher centres, and so manifesting hyperkinesis or super-abundant vivacity of movement. The Will develops not out of sense-impressions but out of instinctive impulses connected with bodily needs. Sucking is instinctive, not reflex, since it ceases when the child is satisfied. The first manifestation of Will proper is seen in the holding up of the head. The chick is unable to keep its head up for the first hour after leaving the shell, and the infant requires a fortnight for acquiring this power. The action of sitting up, which is reached in the third quarter, is like that of holding up the head, developed out of an instinctive impulse. It does not require teaching or example. The same applies to standing and walking, which are reached by a child if left quite to itself. These actions arise through the force of the will which grows with the muscles and motor nerves. Grasping movements are acquired slowly. At first the closing of the fingers on an object as a pencil, the thumb moving with the rest and not independently, is purely reflex. Not till the seventeenth week are serious attempts to grasp objects observable. The first efforts to seize a ball within reach failed: during the operation the eyes were closely fixed on the object, and a sense of wonder, the beginning of an inquiry, betrayed itself. This feeling of wonder is specially called forth by the infant's own arms and feet. For months they seem foreign to it. It gazes on them, explores them with its hands, just like other objects. In the fifth quarter it will bite its own arm so as to cry with pain. These movements only become voluntary, as they are assisted by the representation of resulting satisfaction.

With respect to the Senses, it is to be noted that the skin has little or no sensibility to pricks, &c., for one or two days after birth. According to Prof. Kussmaul's experiments, strong impressions of taste are discriminated from birth. A strong solution of sugar excites astonishment at first, all new sensations being for the moment discomposing; then it is liked and desired. This same power of discriminating strong impressions of sweet, sour, and bitter substances is shared

in by new-born animals. Taste is thus the first sense, and judgment and memory have their earliest development in this region of sensation. The case of smell is very doubtful, not lending itself to observation like taste. New-born children are all deaf. The external ear is not yet open, and there is no air in the middle ear. The first reaction to a powerful auditory stimulus took place six hours after birth in the most favourable case; often it does not occur till two or three days after. In vision too the powers of the new-born child are very low. At first the eyes move quite independently, one moving while the other is still, or one being open while the other is shut, and so on. Symmetrical movements to the right or to the left are rare in the first six days. It is said that the infant turns its head to the bright window after the first day. According to this observer, the action does not appear till the sixth day, and not till the third week does the eye turn to and fix the flame of a candle and follow it when moved. The colour-sense is deficient at first. One child prefers yellow, another red. All dislike black and excessively bright colours. The simple act of blinking when an object is brought near the eye is not acquired till the third month.

The powers of Speech are inherited though not innate. Imitation may assist, but it is not necessary. At first the vowel sounds are uttered. In the seventh week the first consonantal sound, *m*, was heard. The sounds given forth by the infant during this time are not reducible to our alphabetic symbols. In the seventh month the consonants, *m*, *b*, *d*, *n*, *r*, were clearly pronounced, and only these. Imitative sounds first occurred towards the end of the first year.

James Sully.

THE *ACHILLES AND TORTOISE*: A DIALOGUE.

Zeno. *Philophron.*

Z. If I understand you aright, Philophron, you hold that our phenomenal world, though a rough and inadequate picture of the noumenal or *thought* world, is yet a *true* one so far as it goes, corresponding to the truth, not contradicting it?

P. Precisely. Do you, Zeno, discover any contradiction between them?

Z. A most manifest one. The laws of time, space, and motion, as they *really* are, that is, are known by *thought* to be, forbid the supposition that motion, as we know it by phenomenal experience, can ever take place. Phenomenal motion involves a logical contradiction to the laws of motion as we must think them to be in reality. If therefore phenomenal motion *really* exists, it exists, not as motion, but as *rest*.

P. Show me this contradiction, Zeno, and you will go far towards making what I may perhaps call a Monist, or at any rate a Monimist, of me. For I acknowledge, with you, the unappealable character of the laws of logical thinking, in this which is their special province.

Z. Nothing is easier. See, we are now at this end of the terrace. If we continue pacing it, in one minute we shall reach the other end. Is it not so? That is phenomenal motion. Fifty yards or thereabouts in one minute.

P. Certainly. Do you mean that there is a logical contradiction in that?

Z. I do. Listen. You grant me that space, in this case the fifty yards, is infinitely divisible?

P. Granted. It is a law of thought.

Z. Well then, do you not see that, logically speaking, space being infinitely divisible, the fifty yards can never be passed over?

P. But they *are* passed over.

Z. Yes, *phenomenally* they are passed over; but logically they cannot be. That is the very contradiction which I signalise.

P. Pray explain to my obtuseness, Zeno, as clearly as you can, *why* and *how* it is, that the infinite divisibility of the fifty yards contradicts the belief that they can be passed over.

Z. It is because not one of their subdivisions can be omitted, if we are to pass over the whole fifty. But those subdivisions are infinite in number, and therefore require *an infinite time* in order to pass over them. *Logically*, therefore, we shall reach the other end of the terrace when eternity is ended,—and not till then.

P. You startle me. But tell me, Zeno, is not *time* infinitely divisible, as well as space?

Z. Certainly. It is a law of thought.

P. Is not, therefore, the *one minute*, in which we shall be (or *appear* to be) at the end of the terrace, as infinitely divisible as the fifty yards?

Z. It is so, no doubt.

P. Its subdivisions, therefore, are infinite in number?

Z. Certainly.

P. To go through the whole of them, therefore, will require an infinite time?

Z. It would seem so.

P. Is it not, then, a law of thought, on your reading, that one minute is equal to eternity, or perhaps even longer, since, to use your own words, *not till* eternity is ended will the one minute be passed through?

Z. That certainly cannot be among the laws of thought. But I admit I do not, at this moment, see how to avoid deducing it from them.

P. To me it seems quite simple.

Z. Pray how?

P. To perform the division and subdivision of any finite portion of space or of time to infinity, would as you rightly say require an infinite time, that is, a time infinitely *long*. But the divisions and subdivisions are, or rather tend to be, infinitely *short*. The longer the time employed in the division, the shorter become the subdivisions; and all the subdivisions of the one minute are together

equal to the one minute, just as all the subdivisions of the fifty yards are together equal to the fifty yards. To pass over all the subdivisions of the fifty yards requires a time equal to all the subdivisions of the one minute, neither more nor less.

Z. Do you mean that I have assumed a *minimum* of time, beyond which it is not divisible, while refusing to allow a corresponding *minimum* of space?

P. I do. You apply the doctrine of infinite divisibility to the fifty yards, and the opposite doctrine to the one minute. For only by abstracting from the divisibility *ad intra* of portions of time, that is, by assuming for the nonce their indivisibility, can you change the sense of the infinity which attaches to time, and substitute an infinity of addition (κατὰ πρόσθεσιν) for one of division (κατὰ διαίρεσιν). This you do with the one minute, thus making it into a time infinitely long, instead of a time divisible into portions infinitely decreasing. And thus it is that the tacit assumption of indivisibility enables you fallaciously to compare the infinite divisibility of the fifty yards, not with the infinite divisibility of the one minute, but with the infinitely long time requisite to *perform the operation* of an infinite subdivision.

Z. O, my prophetic soul! Now I understand the vision.

P. What do you mean by that, Zeno?

Z. One might, after devising my *Achilles and Tortoise* argument, I heard in my sleep some words, which now come back to me in all their dream-vividness, but which, not comprehending at the time, I suffered to vanish from memory: "the trick of assuming a *minimum* of time, while no *minimum* is allowed to space".[1] Other words followed, which possibly may yet revive in memory.

P. Pray what is the *Achilles and Tortoise* argument, Zeno?

Z. A race is supposed between the swiftest of men and the slowest of reptiles. Achilles moves, say, a hundred times as fast as the tortoise, and the tortoise has, say, a hundred yards start. Then I show that Achilles can never overtake the tortoise.

P. The reason being, I suppose, the same as in our present instance; the only difference being this, that, while we had to reach a fixed mark, the end of the terrace, Achilles has to overtake a moving one, the tortoise.

Z. Hold, Philophron. There is something else; and I rather suspect that the tortoise instance will not be disposed of so easily as the present one; nay, will cast a light back on it, which will again bring out the contradiction, from which you imagine you have cleared it.

P. What is the difference, Zeno?

Z. You will grant, Philophron, that, since we suppose the motion to be genuine phenomenal motion, and the tortoise has a start to begin with, Achilles must arrive at the point from which the tortoise started, *before* he can actually overtake him. I mean that, Achilles moving a hundred yards while the tortoise moves one, and the tortoise

[1] Coleridge: *The Friend*, Vol. III., p. 92 (Ed. 1837).

having a hundred yards start, Achilles after moving the first hundred yards has the tortoise still one yard in front of him. He must move over that one yard *before* he overtakes the tortoise; who will *then* be still one hundredth of a yard ahead. And this will *always* be the case, however small the fractions of a yard may become; Achilles will *always* have *some* fraction of a yard between him and the tortoise; consequently can *never* overtake him.

P. Pray, Zeno, how long do you imagine it takes Achilles to traverse a space of one yard?

Z. Possibly the hundredth of a minute, Philophron. But that is perfectly immaterial to the argument, for I do not say that the time occupied by Achilles in traversing each decreasing fraction of a yard is not infinitely short, but merely that he must traverse every such decreasing fraction *before* he overtakes the tortoise.

P. But you suppose, do you not, that the relative speed of the two remains the same; I mean that Achilles keeps on going, as he begins, a hundred times as fast as the tortoise?

Z. Certainly.

P. How long, then, does it take the tortoise to make a yard, if it takes Achilles one hundredth of a minute?

Z. It takes him one minute, I suppose.

P. Will not Achilles, then, in one hundredth of a minute from the moment where you last left him, that is, when the tortoise was one hundredth of a yard ahead, have outrun the tortoise by ninety-eight hundredths of a yard? For in one hundredth of a minute Achilles accomplishes a yard, and the tortoise one hundredth of a yard, which is in addition to the hundredth which he had to start with.

Z. Yes, Philophron, that is what takes place in *phenomenal* motion; but that is the very thing which I have shown to be *really*, that is *noumenally*, contradictory to the laws of thought. Space and time are *both* of them, as you properly insisted before, and as I admitted, divisible to infinity. Now I take my stand on this property *of them both*, and challenge you to show me how Achilles can possibly *in truth* overtake the tortoise, when both space and time are taken as infinitely divisible, which in reality they are.

P. True, Zeno, they are so; but being infinitely *divisible* is not the same thing as being infinitely *divided*. Actually to divide to infinity that hundredth part of a minute, in which (*phenomenally* as you say) Achilles overtakes the tortoise, is an infinitely long operation, just as in our terrace case. And *this* division you call upon Achilles to perform, before the tortoise can be overtaken, and to perform *phenomenally*.

Z. O, Philophron, the other dream-words come back upon me.

P. What are they, Zeno?

Z. "—— joined with that of exacting from *intelligibilia*, *νούμενα*, the conditions peculiar to objects of the senses, *φαινόμενα* or *αἰσθανόμενα*".[1]

P. Yes, Zeno. For you require that Achilles shall exhibit to the

[1] Coleridge: *ubi supra.*

senses the infinite divisibility of time and space, which appertains to them truly indeed, but only as objects of imagination and thought.

Z. Ah, I see it now, Philophron; the world of *thought* and *reality* is not a world apart, but is identical with the phenomenal world, only differently treated. Is not that what you would imply?

P. It is, Zeno. And I would add, neither is there any contradiction between them. Phenomenal motion is as infinitely divisible *in thought* as time and space are. Of that infinity it is the phenomenon, and not of *rest*, which is not its reality but its contradiction.

Z. I suspect you are right; and certainly I cannot resist your demonstration. Still I do not quite see *how* it is that you compelled me to assent to the tortoise being overtaken, the contrary to what I conceived myself to have demonstrated. Tell me, if you have no objection, by what means you effected it, where was the leverage of your argument?

P. In re-introducing the standard of measurement, which you had removed by postulating division to infinity. Relative speed can only be measured by taking either an unit of space traversed in different times, or an unit of time in which different spaces are traversed. I chose the latter, as you will remember, in comparing the spaces traversed in the hundredth of a minute. And in doing so, I was only holding you to your own statement of the problem.

Z. True. But how had I removed this standard?

P. By comparing the spaces traversed by Achilles, not with a fixed standard, but with the spaces traversed by the tortoise, which were constantly changing,— a "Lesbian rule"; and though it is true these spaces kept shortening, yet you had, in the infinite divisibility of time, a means of imagining the spaces traversed by Achilles to be shorter still, thus leaving always an infinitesimal space between him and the tortoise.

Z. Philophron, you appal me with the simplicity of the solution.

SHADWORTH H. HODGSON.

FOUR NEW PHILOSOPHICAL TERMS.

An air of pretentiousness is, I fear, not to be escaped in any attempt to justify the putting forward of new terms. Mr. Sully, however, in reviewing, in the April No. of MIND, the volume entitled *An Inquiry into the Process of Human Experience*, has made it needful for the writer of it to run the risk, if he is not to seem to admit a very grave fault charged by Mr. Sully against the book. The better plan will be to go at once to the underlying questions:—(1) whether there are or are not specifically-assignable defects in the language before used for psychological inquiry; and (2) whether the words proposed in the volume are real endeavours to remedy the defects, not being wilfully multiplied beyond the proved need, nor being made fantastic for the sake of newness.

Mr. Sully, throughout his notice, does not make the smallest,

faintest admission that there is any deficiency in psychological and philosophical terms. Yet I feel nearly sure that he does not intend to claim adequacy and finality for the phraseology now in use. This, at least, is the first issue between him and myself. I venture to affirm that some further technical words are needed in order to give full articulateness to the later scientific apprehensions of the process of human consciousness. A reader of the critique upon the volume who has not seen the book will possibly not be prepared to learn that the new terms which are put forward are just four in number. They are these :—(1) "The Executive-System" (suggested as a designation of the physical world at the last stage of philosophically considering it) ; (2) "The Neurotic-Diagram" (used as a name for the sensory-cerebral activity which is now known to happen along with each act of consciousness); (3) "Egoistic-Actualisation" (meant to enable us to speak of the occurring and subsisting of our self-cognition from time to time, that is, whenever we are conscious, in a way which avoids as much as possible language that assumes substantiality for the Ego prior to such a theory being considered and decided upon) ; (4) "The Law of Effectiveness" (a name for a working-rule seen to demarcate the bounds of human consciousness—that is, standing for the limits where our experience of self and the world is continually beginning, ceasing, and re-beginning).

These terms necessarily occur in derivative forms, as well as in the above primary spelling ; but no one who had taken the degree of trouble asked to master the significance of the words as they are first used could fail to understand the derivatives. Are these terms, or some words answering to them, needed in scientific language ? Possibly the simplest plan will be to take the phrases one by one, trying to show their applicability.

"*The Executive System.*"—The progress of modern physical science has had for its general effect the establishment of a new kind of philosophical Realism, one greatly differing from the old Realism. Scarcely a thinker of any wide repute could now be found who does not believe that, apart from man's consciousness in respect of it, there exists a world in itself and additional to man. An intellectual inference has established itself of a physical cosmos which is infinite in scale and continuous in duration—subsisting beyond man's range of sensible experience, and also enduring in the lapses of his consciousness owing to sleep, swoon, &c., or when his attention is distracted. Here there is not space to instance the proofs.

But, advancing a further and equally important step, let us add that this world so independent and real, the inference of which is made by modern science so indubitable, nearly all psychologists now agree, is not itself cognisable by us in its process, man's sensations existing only as facts of his own consciousness. The taste of sweetness, the feeling of heat, the phenomena of sound, light, &c., are held to have no subsistence without a sensorially-endowed being in the act of experiencing them. But it results from this view, strictly followed out, that the physical world, in our ultimate philosophical reference to

it, ought not to be spoken of in sensory terms without its being recognised that they do not finally apply. That is to say, a phrase is wanted, which, by the very attempt it shows to leave out all sensory description, will give habitual intellectual awareness of the fact that ultimately the physical world is not sensibly apprehended, but is only inferred.

Let us now try to ascertain what this mental inference of the not-sensibly apprehended world, for which a name is wanted, amounts to.

For this, a further fact needs bringing out clearly—namely, that although sensations, &c., only occur as events of consciousness, and are in themselves mental happenings, they can only arise or exist in a certain order of grouping or sequence—not a simple unalterable order, for its groupings and sequences are proved to be potentially transposable, but the transpositions disclose laws limiting and settling the variety of their occurring. This transposability of the order of our sensations is clearly something additional to the sensations themselves; and the apprehending of this is indeed one and the same with the inference that sensations—no matter how or whence they are actually caused—are only possible when there arrive specific occasions of them, which occasions are practically determined by an operative-process independent of the sensations. Clearly, this is virtually saying that a sensation can only happen along with the occurring of a certain event in a scheme of existence which is additional to our sensory consciousness. What that event is in itself we do not know; we have not any faculty for knowing it. The sensation, or rather grouping of sensations, which arises represents it, so to speak, and in common thinking stands for it. But modern psychology assures us that the sensation is not the cosmical event.

Owing to a specific experience connecting with our own muscular activity (which experience is named Motion), having the closest practical relation with the operative vicissitude of the cosmos—our muscular activity being in fact the ordinary means for transposing the order of the other sensations—this term Motion naturally came to be employed to designate the vicissitude itself, just as if it described the mode of it. But without going into any subtle details, it will be enough to say that it is now agreed by thinkers that the conception of Motion applied to the causative-process of the physical world is finally stultificatory. Whatever the mode of the cosmical vicissitude, it is not Motion. We have, of necessity, to make our calculations of the physical process in terms of Motion, but at the ultimate philosophical stage we have to repudiate that word as not being a real description of the mode.

How the two sets of occurrences, physical and mental, come to exhibit this practical relation, so that a sensation can only happen when the specific cosmical event is occurring, and is sure then to happen if there be right juxtaposition and activity of a human organism, is the final problem of philosophy. With that question we are not concerned here. All that it is needful to establish for the purpose in hand is, that the cosmos has events of its own, which

practically determine those of our consciousness, and that the incognisable cosmical events occur in an order that implies vicissitude, which may be called qualitative if the word quantitative does not appear rightly applicable.

The case is now fully stated. The cosmos is only intellectually inferred by us, but there is in that way disclosed an operative-process going forward, which executively determines our sensations by furnishing the possibilities or occasions of them. This is the ultimate apprehension we get of the world in philosophically considering it; and for the apprehension I ventured to think a name was asked which put off as much as possible complex sensory-associations. The term which persistently occurred to me as best serving the end was "Executive System".

It may, however, properly be asked:—Was there no language already in use which could be availed of? I think that an instinctive effort to supply the want can be traced. Let us run through the list of other terms which has accumulated. The word 'Nature' has been very commonly employed to stand for the cosmical operation; but the word Nature is pictorial—poetry claims it as well as science. It is, in fact, one of the loosest terms we have. 'Matter,' again, though it may be construed so as to be largely abstract, may mean statics, without including dynamics. 'Force' tries to obviate that difficulty, but this word is often used in respect of portions of the scheme of the world, not totalising it. The word 'Energy' is needed for a special significance of its own. By giving to the world as it is philosophically apprehended at its last, most abstract stage, the name of "Executive-System," it was sought to bring out the operative-relation which the cosmos holds to our consciousness, and to commit us to no other affirmation respecting it than this fundamental one of modern scientific Realism. Surely the bringing together of the two words "executive" and "system" does not make a very outlandish phrase?

"*The Neurotic-Diagram.*"—Physiological-psychology may claim as the most fundamental of the principles it has established, that a sensory-cerebral activity is indispensable for the occurring of consciousness as we know it. Even thinkers who hold that the Ego, while we are conscious, adds phenomena which are not assignable in any way of direct relation to the physical process, allow that the neurotic-activity must be happening in the fundamental mode which conditions the self-feeling before any such addition is practicable. But as might be looked for, none of the old phraseology—that is, none of the terms afforded by such words as ideas, notions, feelings, &c.—necessarily indicates this conditioning-operation. I have not space for particulars, but efforts have been made to get a name for the physiological activity. The term cerebration has struggled into use; and some of the more recent inquirers have sought to get a power of further specialising the process by speaking of neural tremors, grouping of nerve-units, and so on. All this has, I believe, helped. But I ventured to think that a further term was needed—one which, while

being a direct reminder of the nervous-apparatus, should distinctly allude to the fact of a specific modification of its operation being needed in and for each distinct experience. For nervous anatomy has not only made out that during consciousness there must be some cerebral activity, but has shown that answering to each act of consciousness there is a precise allotment of the neurotic-operation.

The premature classifications of phrenology have fallen into discredit; if, however, they had fully maintained themselves, the names of the "bumps" would still have needed supplementing by a word capable of naming their grouping in associated activity. At this moment, despite the striking experiments of Dr. Ferrier, scarcely any one pretends that, excepting as to the sense-organs, and a few general functions of the cerebellum and some other parts of the brain, it is possible strictly to localise the activity. But everybody agrees in an inferential conclusion to the effect that, for each individual act of consciousness there is a specific interplay of parts of the cerebral system, and that there must be habituated local allotment of the neurotic machinery in this way. Is not this the same thing as saying that in and for every individual act of experience there is *demarcation* and *configuration* of the neurotic activity? If the brain were open to observation, and we could sensibly trace its operations in all their minutiæ, we are forced to believe that we should witness an associated, related activity which would be diagramatically reproducible.

It was for the purpose of serving as a name for this physiological aspect of the process of our consciousness that I suggested the phrase "Neurotic-Diagram". It seemed to me that it recognised the fact of neural-activity being indispensable for consciousness, and at the same time kept in view that in each case there is specific configuration or demarcation of the sensory-cerebral movements. Supposing that experimental knowledge ever enabled inquirers to strictly localise functions in the nervous system, then the specific neurotic-diagrams might be designated classificatorily. That, of course, is the unhoped-for ultimate ideal limit of progress in this matter; but how could any step towards it be practicable without some such generic name as the volume proposes?

I have not space to urge in any detail the convenience of the phrase in describing the phenomena of aphasia, epilepsy, &c.; nor how it throws light upon the use of hypothesis in reasoning, and on the distinction between Memory and Imagination, on the shortening of chains of ideas, &c. My own experience forces me to believe that the use of the term would brush away much mistiness from the prevailing psychology, which is continually forgetting its physiology. Is the phrase a very hard one? Do "neurotic" and "diagram," both plainly understood words when they stand apart, suddenly grow unintelligible on being brought near?

"*Egoistic-Actualisation*" and "*The Law of Effectiveness.*"—I couple the third and fourth of the terms, for the explanation of the one runs into the other. In the brief construing, earlier given, of the phrase "Egoistic-Actualisation," it was claimed for it that it enabled

us to speak of our self-awareness phenomenally, without assuming in the very words we start with substantiality of the Ego. If a thinker refuses to grant entity to the Ego, he still has to allow that something which practically amounts to egoistic-actualisation happens whenever consciousness begins or resumes. Well, is there or is there not an advantage in a term which strictly defines what must be conceded by everybody in this first stage of describing what happens mentally?

But, as I previously said, this term practically connects itself with the use of the fourth and last of the names proposed, *viz.*, "The Law of Effectiveness". In reference to it, I beg leave to posit two facts:— First, that our self-consciousness intermits from time to time, *viz.*, in sleep, during miscarriages of attention, &c. Secondly, that all the sensations, one or more of which must be in the act of going forward whenever we are aware of ourself and the world, only arise and only last while the conditioning-operation of the world (*i.e.*, the Executive-System) observes a specific range of what we call rate, volume, direction, &c. I suppose that both these statements will be admitted by everybody. Now, the practical observance in our experience of these limitations is probably describable as the working of a Law; that is, the executive-operation for the conditioning of human consciousness is found to be effective only within such-and-such a range of its vicissitude. But is there at present any distinct and compendious recognition of that fact in a verbal expression, which will keep prominent in our thinking this practical limitation of our consciousness by the term recurring continually in the expository phraseology? I did not know of any.

In the absence of a periodical use of some such qualifying term, not a little language to be met with in the works of eminent psychologists confuses the true state of the case. We hear of the mental and physical sides of a fact, as if consciousness and the universe were, so to put it, conterminous. In truth, only a few of the cosmical events can rightly be spoken of in that way. We hear, in a general unrestrictive way, of consciousness being a function of the organism, as if all the activities of the organism rendered phenomena of sentiency in our experience. On the contrary, nothing has been more decisively proved by modern science than the fact that it is perfectly easy by either heightening or lowering, widening or narrowing, the physical operations—named "impressions" in the old terminology—to nullify their power of challenging the Ego and of furnishing sensations. Only a limited range out of the total possibilities of intra-bodily executive-operation has the power of conditioning human experience. By the use of the term "Law of Effectiveness" in connexion with the other related phrase "Egoistic-Actualisation," the true state of the case is recognised. If the phraseology starts a further inquiry, namely, as to the sanction enforcing these limitations, that problem has to be accepted like any other. It is advisable that we should know exactly where we stand, and if a problem is naturally suggested which has finally to be pronounced

insoluble, still the fact of the suggestion of the problem is valid in itself and is part of the situation in which we find ourselves.

I have reached the end of the proposed innovations in phraseology, and in doing so have fully exhausted the space I can expect from the Editor. I will only ask—Were these four terms needed? Are they very formidable? Do they bear marks of any wish to coin new verbiage for novelty's sake? I must leave the answers to the reader. I am not complaining that the terms must of necessity fight their own way. It is on the whole well that some penalty should attach to any meddling with language; and I foresaw that I was incurring the disadvantage, but felt compelled, for what seemed to me good reasons, to submit to it. The future will show what degree of versatility in this respect there is among the class of readers to which the volume addresses itself.

I should not like to conclude without mentioning that I have in another way thanked Mr. Sully for the generous appreciation of his review in respect of the points which he found himself able to approve.

William Cyples.

THE ETHICAL METHOD OF EVOLUTION.

It may be of some service to students of Ethics to have stated in a concise way the principal questions discussed in the *Data of Ethics*, so far as there seems to be originality in the discussion, and further, in the same connexion, to have presented the assumptions that evolutionists must make before they can establish a new method of Ethics. We propose here to review briefly Mr. Spencer's criticism of other views, with the object of arriving at an estimate of the value of his proposed alterations.

I. (1) Mr. Spencer asserts—"There continues to be entire satisfaction with that form of utilitarianism in which the causal relations between acts and their results are practically ignored" (p. 58); and he goes on to say that utilitarians make no use of deduction in their method. With this position it is only necessary to compare the sixth book of Mill's *Logic*, *passim*. We select one or two sentences out of a hundred that would answer the purpose. As to the formation of character, 'The empirical law derives whatever truth it has from the causal laws of which it is the consequence'. 'Now to such cases we have seen that the Deductive Method, setting out from general laws, and verifying their consequences by specific experience, is alone applicable.' The very illustration used by Mr. Spencer in regard to "the course of one who studies pathology without previous study of physiology" as resembling the usual course of moralists, is one used by Mill for precisely the same purpose:—'Students in politics thus attempted to study the pathology and therapeutics of the social body, before they had laid the necessary foundation in its physiology' (*Logic*, B. VI., c. vi., § 1). In fact Mr. Spencer's volume is very curious reading, taken in connexion with the sixth book of the *Logic*.

(2) Mr. Spencer rather cautiously opposes Mr. Sidgwick in regard to the "fundamental assumption of Hedonism," that feelings as feelings can be arranged in a scale of desirability. He gives two reasons for his opposition; first, although "indefinite things do not admit of definite measurements, yet approximately true estimates of their relative values may be made when they differ considerably" (p. 152). Elsewhere we find the statements—"The philosophical moralist is obliged wholly to ignore any deviation from strict rectitude. It cannot be admitted into his premisses without vitiating all his conclusions" (p. 272). Mr. Spencer adduces the analogy of geometry to show that Ethics ought to deal with ideally perfect human relations, and rebukes Mr. Sidgwick severely for maintaining that geometry can deal with irregular lines. It appears that Mr. Sidgwick's offence consists in not introducing the word 'approximately'. Since all lines known to our senses are irregular, it seems not improper to consider that geometry in some sense does not refuse to deal with them.

The second reason given by Mr. Spencer is as follows:—"Even if the relative values of things are not determinable, it remains true that the most valuable should be chosen." "Because I believe that of many dangerous courses I ought to take the least dangerous, do I make 'the fundamental assumption' that courses can be arranged according to a scale of dangerousness" (p. 153). It is enough to say that the word 'dangerous' has no meaning, unless it is possible to compare objects or acts with reference to this quality. Mr. Spencer's own illustrations of the relativity of knowledge make it plain that we could not know that a course was dangerous at all, unless we could measure it against other courses. It is difficult to comprehend how the maxim 'Take the least dangerous course' is supposed to have originated, when no difference between courses in respect to danger could be discerned.

The motive of Mr. Spencer's opposition is his desire to introduce Justice as a principle from which right action may be deduced without calculation of pleasures. But he has himself shown that justice is only a means to happiness (c. iii.), and it is impossible to do this without an acquaintance with the consequences to happiness of just acts. Of course, if Mr. Spencer insists that a just act is one that *must* produce happiness, and refuses any inductive proof, the question becomes merely one of definition, and controversy is profitless.

(3) It is somewhat perplexing after this apparent denial of any direct comparison of pleasurable results, to listen to Mr. Spencer's comments on the 'hedonistic paradox'. He thinks this no paradox, because it is a general law that the pleasure attendant on the use of means to achieve an end, itself becomes an end. No one, perhaps, ever disputed this, but since the paradox holds of pleasures connected with the use of means, the explanation misses the mark. If such pleasures are made the conscious aim, the highest zest and flavour are gone from the pursuit. Probably nowhere is the failure more signal than in the case cited by Mr. Spencer, where the admiration of others causes the pleasure. He seems himself paradoxical when he maintains

that happiness cannot be reached by making it the immediate object of pursuit, and at the same time insists that the pleasure of using means itself becomes an end. This latter pleasure is happiness;—if happiness cannot be reached by direct aim, the happiness derived from the use of means cannot be gained by aiming at it.

Mr. Spencer, in criticising Bentham, remarks that what pleasure is, is an extremely uncertain question. As his theory is based on the principle that pleasure is intimately connected with welfare, it seems to follow that if we cannot tell what pleasure is, we cannot tell what welfare is. If we had any means of determining welfare without reference to pleasure, we might dismiss happiness altogether as an end. But as Hobbes's principle, Pleasure helpeth vital actions, is fundamental to evolution, this way of escape is cut off.

(4) Mr. Spencer's ideas concerning Justice deserve a little examination. It "is concerned exclusively with *quantity* under *stated conditions*, whereas happiness is concerned with both *quantity* and *quality* under *conditions not stated*". It refers to "the relative amounts of actions, or products, or benefits, the natures of which are recognised only so far as is needful for saying whether *as much* has been given, or done, or allowed, by each concerned, as was implied by tacit or overt understanding, to be an equivalent". Overlooking the objection that justice is here confined to the market-place, it is to be observed that it is not a simple matter to determine that one act, or one part of a course of action is equivalent to another. It is impossible, as a rule, to specify all the circumstances that may affect future acts. It is impossible that the understanding of all persons interested in a certain transaction should be the same. Some expectations must always be disappointed, and in such cases the consideration of happiness generally controls the decision. "Differences of age, of growth, of constitutional need, differences of activity and consequent expenditure, differences of desires and tastes," which Mr. Spencer thinks impossible to be estimated by a utilitarian, must all be estimated before any course of action can be said to be *equivalent* to any other course. And if a comparison of pleasures is impossible, this estimate is impossible.

But it cannot be admitted that justice consists simply in the fulfilment of contracts. Very few persons in the lowest ranks of labour, perhaps, regard their wages as an equivalent for their pains. It is all they can get and they take it, but to say that justice is confined to giving them it, is to say that the existing social arrangements are perfectly just, which Mr. Spencer does not maintain. If he is talking of justice in an ideal state, he still has to suppose every person in making a contract to be able to decide what will be an equivalent for his sacrifice and to do this without a comparison of pleasures.

(5) In attempting to expound Absolute Ethics Mr. Spencer seems to be inconsistent with himself. We are told that "the moral law is the law of the perfect man—the formula of ideal conduct—is the statement in all cases of that which should be, and cannot recognise in its propositions any elements implying existence of that which should not be. . . . No conclusions can lay claim to absolute truth, but such as

depend upon truths that are themselves absolute, &c." (p. 271). At the close of the treatise we are informed that "a code of perfect personal conduct can never be made definite. No specific statement of the activities universally required for personal wellbeing is possible." If a code of perfect personal conduct can never be made definite, it can hardly be called absolute. And if personal conduct cannot be defined, race conduct or national conduct cannot be defined. The least objectionable compromises of the claims of an indefinite Absolute Ethics with those of a defective and empirical Relative Ethics, with no standard of objectionableness to appeal to, is all that we have to guide us in weighing the claims of present self against the claims of future self, and our own interests against those of others.

(6) In criticising the expression, 'Every one to count for one, &c.,' Mr. Spencer asks—"Does this mean that, in respect of whatever is portioned out, each is to have the same share, whatever his character, whatever his conduct?" The answer to this question may be found by Mr. Spencer in the quotation that he himself makes from Mill. 'The Greatest Happiness Principle is a mere form of words without rational signification, unless one person's happiness, supposed equal in degree (with the proper allowance made for kind), is counted for exactly as much as another's.' Mr. Spencer goes on to maintain that it would be absurd to divide equally "the concrete means to happiness" *(quantity* under *stated conditions)*, because "differences of age, of growth, of constitutional need, differences of activity, &c.," would prevent the greatest happiness from being even proximately secured (p. 223). It is "the conditions under which each may pursue happiness" *(quantity* and *quality* under *conditions not stated)*, that are to be equally distributed. It will hardly be thought that such a distribution, which must take into account all the peculiarities of individual character and the possible effects of outside forces, is a simpler task than that of comparing pleasures.

After ridiculing all the attempts of others to attain equality in the distribution of happiness, on account of individual differences, Mr. Spencer proceeds to state that in the case of his theory it will be convenient to disregard this objection. "Though . . . we cannot regard the members of a society as absolutely equal, and therefore cannot deal with problems growing out of their relations with that precision which absolute equality might make possible; yet considering them as approximately equal in virtue of their common human nature, and dealing with questions of equity on this supposition, we may reach conclusions of a sufficiently-definite kind" (p. 285). The objections to equalising the treatment of good and bad seem to have now disappeared. The "differences of age, &c.," that formed an insuperable obstacle to the utilitarian, may be waived by the evolutionist. Mr. Spencer seems to overlook the fact that if he can get sufficiently-definite conclusions by assuming the approximate equality of all men, his adversaries will claim the right to make the same assumption, and get equally definite conclusions; while critics will deny the right to both, upon the ground that it is precisely because

men are not, even approximately, equal, that Ethics is a difficult field of study.

II. We now proceed to consider the assumptions necessary to Mr. Spencer's conclusions. The essence of his theory may be stated in a few words. We are now to employ the deductive method in morals. The immediate object of pursuit should now be conformity to certain principles which, in the nature of things, causally determine welfare. Hence welfare and the principles that determine it must be defined. Conduct is good or bad according as its aggregate results are pleasurable or painful; and good conduct is highly evolved conduct. Conduct is most highly evolved and therefore best, when the making of all adjustments of acts to ends subserving complete individual life, together with all those subserving maintenance of offspring and preparation of them for maturity, not only consists with the making of like adjustments by others but furthers it. The complete life is the life that is the greatest possible both in length and breadth. Length of life perhaps requires no definition; breadth of life varies as the sum of vital activities, or with the number and variety of adjustments of acts to ends. Hence we may suppose that life to be the broadest wherein the number of adjustments, allowing for variety, is the greatest possible.

(1) The first assumption that we will consider is this. *The proportion which variety, in the adjustment of acts to ends, bears to number, is knowable.* Unless we can say whether one life containing a greater number but a less variety of adjustments is more or less broad than another, we cannot tell what breadth of life is. And if not, we cannot define complete life, for life is estimated by multiplying its length into its breadth. If we cannot tell what complete life is, we cannot tell what conduct is most highly evolved or best. The only attempt to remove this difficulty has been already alluded to. If we consider the members of a society as approximately equal, of course we need not trouble ourselves about the breadth of their lives. In regard to the knowableness of length of life, the same assumption is made, and the same criticism will apply.

(2) Supposing that we are able to reduce quality of adjustment to terms of number, it is then necessary to assume that *the greatest possible number of adjustments is a knowable quantity.* We must know the final number of possible complete lives upon the earth, so as to regulate our acts with reference to the production and maintenance of this number. Any miscalculation will result in a diminution of positive happiness or an increase of positive misery. Without this knowledge, we cannot say of any act that it is best.

(3) *The proportion between acts that subserve complete individual life and those that subserve maintenance of offspring is knowable, as well as the relation of this proportion to all similar proportions.* Most of the problems of life require, for their perfect solution, this knowledge. Mr. Spencer's system must suppose that there is no uncertainty about the numerical relations of a single proportion, if it is to be absolute in character.

(4) Absolute welfare being thus established, it is found to be a state where the adjustment of acts to ends results in the adjustment of acts to ends. To connect welfare with happiness the doctrine of the relation of pleasure to welfare is introduced. Mr. Spencer defines pleasure as whatever feeling we desire. This, as Mr. Sidgwick observes, is not a psychological truth, but a tautological assertion. Even if we consider pleasure as agreeable sensation, and admit that all our activity is directed to the attainment of this end, which is certainly more than would commonly be assumed, several additional assumptions are necessary before the doctrine is of service to Mr. Spencer.

(5) It cannot be denied that the choice of a present pleasure instead of a present pain often results in death or diminution of life. But, it is urged, this merely shows "that special and proximate pleasures and pains must be disregarded out of consideration for remote and diffused pleasures and pains" (p. 85). Mr. Spencer's doctrine seems a curious blending of the Aristotelian mean and the Socratic view that virtue is knowledge. But he has elsewhere committed himself against the fundamental assumption that pleasures are measurable, and what guidance we are to have in disregarding special pleasures is not clear.

(6) As the conditions of existence have changed in the past, misadjustments of feelings to the requirements have arisen, and failures of guidance by pleasures and pains. "But lack of faith in such further evolution of humanity as shall harmonise its nature with its conditions, adds but another to the countless illustrations of inadequate consciousness of causation." "Progress cannot cease till complete adaptation is reached." We will not stop to compare this view with that of the Millenarians, and will only suggest that even death is only necessary on the assumption of an arbitrarily fixed vital force that is gradually expended. The assumptions here made are, first,—*Happiness has gradually increased.* This would be denied by an increasing school of pessimists. Secondly,—*The conditions of existence which have hitherto been occasionally changing, will become fixed.* If not, misadjustments and failure of guidance will continue. This assumption requires a host of others as to the infinity of the universe down to the permanence of the supply of coal. Thirdly,—*What the ultimate conditions of existence will be, and when they will be established, is knowable.* Without this knowledge we cannot correct misadjustments, nor distinguish the true value of remote pleasures. And an error of a million years in his calculation might transform a paragon of virtue into a monster of vice. Fourthly,—*The conditions of existence that will intervene between the present and the ultimate conditions are knowable.* Natures adapted to one set of conditions must be gradually adapted to changing conditions and these latter must of course be known.

(7) At the beginning of his treatise Mr. Spencer declares that no part of conduct can be understood unless we understand the whole, not only of human but also of animal conduct, and not only all present but all past conduct. Such being the condition, we welcome some of the criticisms that occur elsewhere in his treatise. "The few factors

in this immense aggregate of appliances and processes which are known, are very imperfectly known, and the great mass of them are unknown." "Throughout a considerable part of conduct, no guiding principle, no method of estimation, enables us to say whether a proposed course is even relatively right."

(8) It would be now in place to consider the principles that causally determine welfare. We have been able to discover but one principle that is not too vague and general to be useless,—the principle of Equity or Justice. But since this principle is fruitful only on the supposition of the equality of the members of a society, it perhaps requires no especial consideration. As to the general value of this system of Ethics, we cannot suppose that Mr. Spencer will be contented with the position of a medical adviser assigned him by Prof. Bain in his review in MIND. The system has the strength and the weakness of other systems that assume a knowledge of final causes. Grant to any one the gift of the seer and the elaboration of a system is not difficult. But no such system is favourable to freedom, for it involves the belief in a part of mankind, that the freedom of the rest can lead only to their misery. The only ground of freedom is in the uncertainty of the future. Remove that, and the lives of all men ought to be marked out for them, and any divergence from what is known to be for the general good must be punished. This is the doctrine of the Roman Church. It is also a doctrine to be learned from the *Data of Ethics*.

D. M'G. MEANS.

BRUTE REASON.

Is the obscurity in which this subject still remains involved really owing to any impenetrable abstruseness of the subject itself, or is it due, even partially, to any mistake in the usual mode of treating it? To many persons the question may seem bold; to some, even frivolous. Mr. Darwin tells us, probably with much truth, that "few persons any longer doubt that animals possess some power of reasoning". Yet, notwithstanding this growing unanimity, one looks in vain amongst the writings of those who favour the notion of brute reason for any defence of it which does not involve the violation of fundamental principles of logic, or of philosophy, or of both. Take a few of the writers of the present century. First, as to *instinct*. Lord Brougham (*Dialogues on Instinct*) held instinct to be the "constant, immediate, and direct operation of the Deity," a conceit the authorship of which he attributed, somewhat gratuitously, to Sir Isaac Newton. Mr. Herbert Spencer defines instinct as "compound reflex action"; while many persons, of various degrees of culture, vaguely imagine it to be an intelligent endowment, or innate intelligence, which they expressively denominate "instinctive knowledge".[1] It is clear that in each of

[1] See an article on "Instinct," by D. A. Spalding, in *Macmillan's Magazine*, No. 160.

these cases the subject of the proposition is instinct itself, which is necessarily unknowable, rather than its phenomena and attributes, which are more or less discernible by us. Then as to *reason*. Hume had affirmed earlier that "no truth" appeared to him "more evident than that the beasts are endowed with thought and reason as well as men". Mr. Darwin (*Descent of Man*) says that "animals may constantly be *seen* to pause, deliberate, and resolve;" and Brougham formally states both the question itself and what he conceived to be the proper mode of dealing with it in the following terms:—

"I think there can be no doubt here. We must examine it in accordance with the rules of inductive science. The facts are before us. Some we gather from observation—those relating to the animals; some, as those respecting the nature of the human mind, we ascertain by our own consciousness, or at least chiefly by that, though in some sort also by observing other men's conduct, and communicating with them; but having no means of communicating with the animals, we are reduced to our observation merely, and then we naturally draw the inference that, because the same things done by ourselves would be known by us to be done from certain mental powers, therefore we ascribe those powers to the animals."

I have written Brougham's statement at length because it equally well expresses the general position of believers in brute reason in our day as in his. Taken collectively, these quotations show a startling amount of questionable logic, questionable philosophy, and general confusion of ideas.

(1) The nature of instinct is confounded with its attributes and phenomena—*e.g.*, by Brougham, Spencer, and believers in "instinctive knowledge".

(2) The inferences and conjectures of the writers are confounded with the facts from which they are drawn—*e.g.*, by Hume and Darwin. The practically logical character of much of the conduct of animals is surely all that may be "seen" by us, or that can in any sense be said to be "evident"; and is the *fact* from which deliberation, resolve, or reason on the part of the animals is *inferred*. Intellectual processes can neither be "seen" by nor be "evident" to observers.

(3) The "rules of inductive science" are uniformly and persistently violated by arbitrary selections of facts apparently favouring the writers' views, without due regard to the phenomena as a whole and their collective significance. The notion of brute reason is founded upon the external resemblance of part of the conduct of animals to the known rational conduct of man. It ignores, however, the fact of a vast body of phenomena in the conduct of the animals themselves — namely, those actions known as "purely instinctive," as well as in the motions of plants and chemical substances—phenomena identical in point of outward logical character with those selected, except that they occur under conditions which are considered to preclude any possibility of rationality. The induction, therefore, is doubly imperfect, and the conclusion a *petitio principii*.

(4) Abstract questions are confounded with questions of observa-

tion and experiment. It seems but a truism to affirm that this question, in so far as it is one of intellectual powers and operations, is no less purely and simply a question in mental science than any concerning the intellectual powers and states of man. Hence the naturalist's claim to authority here is as untenable as would be that of the chemist in pathology.

Now, the due observance of the several practical principles thus overlooked in their application to this question—principles which lie at the foundation of all philosophising—would compel us to recognise this important fact, namely, that the *nature* of instinct being absolutely unknowable, it follows—(1) that the scope of its operation is *à priori* unknowable; hence (2) that rationality cannot be predicated of animals until, *(a)* that scope is ascertained, and *(b)* the rationality itself is proved, which (3) cannot be done by observation or experiment. The simple recognition of this fact would at once clear the ground of a number of misconceptions which have tended to obscure the subject, and we may at once premise the following general position, namely—

That the question of brute reason necessarily involves, and forms one with, that of the scope of instinctive operation; that it is a general question, a question in deductive philosophy, and can only be determined, if at all, by reference to certain general facts and principles.

Instinct is commonly supposed to be restricted in its operation to certain general routines peculiar to each species under normal conditions—to action only in certain lines fixed in the constitution of the animals determined by their necessities in a state of nature, so that in any animal placed in other than its ordinary and natural circumstances the operation of instinct is suspended. But nature, it is further supposed, anticipating such a contingency, has endowed the animal with the power of reasoning by which to guide itself in the new condition of things. Manifestly if there be any such limitations, reason, or something practically equivalent to it, must be as necessary a condition of existence with animals as with men, since without it they would in abnormal or unusual circumstances be wholly destitute of guidance; while if there be no such limitations there can be neither need nor room for reason, since instinct rules the whole domain of voluntary activity.

It may also be at once conceded that if one single action of any individual animal could be shown beyond question to have resulted from reasoning on the part of the animal, the rationality of that animal would be thereby established, and such individual would stand good for the entire race. There would then be no need to multiply examples. One unequivocal instance of reasoning would be as good as ten thousand, and one individual rational animal as good for determining the question as the entire brute creation. The chasm between man and the brute would then have been bridged; the controversy would be at an end.

Has any such unequivocal instance of brute reason ever been known? No one can seriously affirm that it has. Many persons

have, of course, believed certain actions to be rational, but no one can point to any one of them and say, 'That was the outcome of reasoning on the part of the animal'. The semblance may be very striking, but the identity is, so far, involved in doubt. Clearly, to multiply such examples is useless. If we cannot be sure as to any one of them, neither can we as to any number of them. A myriad of such examples are but so many illustrations of the same unanswered question, and were every animal in existence to furnish innumerable instances of the kind, the question would be no nearer solution. That question is not, whether the conduct of animals in any instance *appears* to be rational? All are agreed on that point. The real and only question at issue is, *whether the appearance is true or illusory?* This cannot be determined by observation of particular actions of individual animals. It is a general question, and if dealt with phenomenally at all, the phenomena must be taken as a whole—not merely from the world of animal life, even, but from every department of nature. Yet when treated thus strictly "in accordance with the rules of inductive science," the question would be but little the forwarder, while the balance of evidence would not be found to favour the notion of brute reason. A fowler spreads his net to catch birds, a fisherman fish, a spider flies, and each constructs his net, and places it in such advantage of locality and position as may best conduce to that object. No one doubts that the conduct of the spider is instinctive, or that of the fowler and fisherman, generally speaking, rational. Yet, so far, the "rules of inductive science" would clearly require us to refer the conduct in either case to the same "mental powers," and to conclude either that all are rational or all instinctive, for *prima facie* there is no difference between them. But it is obvious that to stop here, to argue the rationality of the spider from the known rationality of the fowler and fisherman, while ignoring similar phenomena exhibited under other conditions, would be, "not in accordance with," but in direct violation of, the "rules". The practically logical character of the actions being the real and only point of the induction, the "facts before us" must comprise *all actions in nature exhibiting that quality.* Hence the motions of plants and of chemical and elementary substances must come under that class, since they exhibit that quality in a high degree. When the roots of a tree growing near a ditch, instead of continuing in the direction of the ditch, shun exposure by descending even into unfriendly soil, and passing underneath the ditch, ascend to their proper soil on the other side; or when a vine, avoiding low vegetables and other obstructions, passes on to a more distant pole, and climbs it; when elementary substances exercise their mutual affinities and antipathies, faithful in both to the mysterious law of combining proportion, or crystals assume their respective geometric forms in obedience to a law no less mysterious, they practically discriminate between the useful and the useless, between safety and danger, order and confusion, beauty and deformity, and in choosing the one and avoiding the other, employ means to ends. These phenomena are in no way explained by reference to any

known physical forces, any more than the like phenomena in animals; and, therefore, in any strictly inductive inquiry into this question they must, like them, be included within the category of the "facts before us". The affirmation concerning the conduct of animals that "the same things done by ourselves," *i.e.*, actions of discrimination, design, and purpose, "would be known by us to be done from certain mental [rational] powers," applies with equal force here; and the only conclusion, if any, that can be legitimately drawn from the facts as a whole is that, as we are precluded by the nature of things from ascribing the conduct of plants and chemical elements to reason in the agents, neither may we that of the animals, our ignorance of its real causes being the same in either case. So far, then, our general position seems not unwarranted. The question must be determined, if at all, by reference to general facts and principles. Let us, therefore, inquire whether such limitations and distinctive conditions as are commonly ascribed to instinctive operation are *compatible* with the existence and exercise of reason in the same individual animal?

Brougham and others restrict the operations of instinct to "*ordinary and natural circumstances*," and distinguish them from "rational" actions by their being performed "*without knowledge or design*," "*without instruction, experience, or knowledge of consequences*," &c. We have already observed that the reason-hypothesis *implies* some such restrictions. There is much ambiguity about these phrases, but construing "ordinary and natural" as liberally as we may, as comprehending, say, any circumstances to which an animal may have been accustomed by habit or early familiarity, it follows, even then, that the conduct of a large proportion of the animal world must be less instinctive than rational. Animals tamed, domesticated, or confined after living wild or free, can have but few, if any, opportunities for the exercise of instinct. Even animals still wild, whose general condition of life must be, if any be, considered "natural," find themselves very frequently in circumstances quite new to them, and calling for new lines of action; in all which cases the operation of instinct is, according to this rule, suspended. Suppose such instances to become more frequent —then, reason being the alternative, those animals become, in the same proportion, rational, and even reasoning beings; and by the same rule, if placed in circumstances altogether abnormal or unusual, they would thereupon become wholly rational and always reasoning. Apply this to all the animal races, and by a mere mechanical change of outward circumstances, accidental or otherwise, instinct would cease to exist amongst animals, and reason alone would rule their entire conduct.

Still less tenable seems the twofold assumption which connects these limitations of "ordinary and natural circumstances" with the *distinctive qualities* of instinct referred to in any individual possessing the power of reasoning. Almost any of the examples of supposed animal reasoning adduced in contradistinction from those of instinctive action will serve to make this more or less manifest. Huber's well known experiment of inserting a piece of glass in a hive across the line in which the bees were building, affords

a good one, from the sharp contrast which it is supposed to present to, as well as its close practical connexion with, their "purely instinctive" operations. Bees ordinarily lay the foundations of their combs in an approximately straight line (though the combs themselves often become warped during construction, owing, probably, to variations in the temperature). Both Brougham and Spence[1] adduce the conduct of the bees in this case as an instance of reasoning. Upon the obtrusion of the glass, on which it would have been unsafe to build, the bees, instead of continuing their work in a straight line, as heretofore, changed its direction just before reaching the glass, laying the remaining portion of the foundation at right angles with the former, and so at once avoided the glass and saved their previous labour. This, these writers and others imagined, could only have resulted from reasoning. Up to the point of the obstruction, or thereabouts, it is said, the bees acted instinctively, but the alteration of the work and its adaptation to a circumstance so unusual could only have been effected by deliberation and design—in short, reasoning.

Whatever of feasibility may seem, upon a superficial view, to attach to this conclusion disappears the moment we begin to examine it. In turning the comb the bees, we are told, acted rationally; they both *knew* and *intended* what they were doing. But what does this mean? *What* did they know and intend? Till then they were building a comb, as usual, in a straight line, full of hexagonal cells, with rhomboidal bottoms. Did they know they were building such a a comb? According to these writers they did *not;* they were acting instinctively, and therefore "without knowledge or design;" they only knew they were "putting particles of wax in a place" (Brougham); they knew neither why nor precisely where; the shape and construction of the comb were entirely the result of "blind instinct"; they knew nothing of the comb as such, and nothing whatever of any plan of construction. The glass, however, being obtruded across the line of their progress, it became necessary either to build upon the glass, or abandon the work, or change its direction. The bees adopted the last of these alternatives. Here, however, they not only designed a new plan; they also executed the design, performing the whole variation with the same consummate skill that characterised their work performed on the original plan. Now, granting that bees ordinarily build "without knowledge or design," how, on the reason-hypothesis, does the case stand with regard to this variation?

It is admitted that till now the bees knew nothing of hexagons and rhomboids, and, therefore, nothing of their geometrical significance. All at once, then, upon the very first glimmer of intelligence, they must have perceived, for the first time, not merely the comb, but also its various purposes and relations; not merely the wax, but the necessity for the utmost economy in its use as the building material. They must have ascertained, "without instruction or experience," what

[1] See the chapter on "Instincts of Insects" in Kirby and Spence's *Introduction to Entomology.*

no human intelligence could ascertain without considerable mathematical instruction and experience, namely, the precise form in which to construct the cells of the comb, so as to secure a maximum of strength and storing capacity in the structure, with a minimum of space and material; and, therefore, have informed themselves of the full significance and geometrical value of hexagonal cells with rhomboidal bottoms, an achievement which, to human reason, could have been possible only by dint of a complex series of abstruse mathematical computations. Further, they must have perceived the risk they would entail upon the entire structure by laying the foundation, or any part of it, upon the glass instead of upon the woodwork of the hive, and therefore have acquainted themselves, still "without instruction or experience," with the differing properties of the wood, the wax, and the glass. These perceived, together with the necessity for turning the comb to avoid the glass, they must then have ascertained the necessary gradations and modifications in the sizes of all the cells in the vicinity of the glass for effecting the proper angle in the comb upon the same economical principle; which could only have been accomplished by another series of still more complex calculations. Even this comprises but a few of the facts which their intelligence must have grasped, and but a portion of the work which they had to achieve. Yet, upon the reason-hypothesis, they both grasped the facts and accomplished the work; for they "shortened the lengths of the cells; diminished their diameter; gradually made them pass through a transition from one state to another, as if they were making the instinctive process subservient to the rational; and, in fine, adapted their building to the novel circumstances imposed upon them, making it in relation to these what it would have been in relation to the original circumstances if they had continued unaltered". Thus they had to arrive, by regular logical processes, necessarily very complicated and involved, at conclusions, the several premisses of which they not only were wholly ignorant of, but had no means whatever of acquainting themselves with. Brougham's language, therefore, in describing their "*purely instinctive*" actions, is exactly descriptive of their conduct in this case:—"We perceive certain things done by these insects without instruction which we could not do without much instruction. We see them working most accurately without any experience in that which we could only be able to do by the expertness gathered from much experience." Yet, according to this same writer, and others, all this was accomplished in the case of Huber's experiment *intelligently*, though they had but just become aware, for the first time, of the existence of hexagons and rhomboids, and were necessarily as destitute of any sort of education or experience with regard to them as a new born babe!

Here, then, is one out of numberless instances of supposed animal reasoning, the examination of which would doubtless issue in similar results. What are those results?

(1) That if the alteration of the comb was effected *instinctively*, the limitation of "ordinary and natural circumstances" cannot be

maintained, since the conditions here were neither "ordinary" nor "natural".

(2) If the change was performed *rationally*, then appropriateness of action "without knowledge or design," and "without instruction, experience, or knowledge of consequences," cannot in any sense be characteristic of instinct, since they are equally compatible with reasoning, however elaborate and accurate.

Clearly, then, unless instinct and reason are practically identical, these instinctive limitations and conditions are wholly inconsistent with the existence of reason in the same individual.

Would it not be more consonant with the phenomena as a whole, and therefore safer as a hypothesis with which to start in any inquiry into animal psychology, to suppose instinct to be limited in the variety and extent of its range, not by place and circumstance, but by the scope of the *physical* powers with which it is conjoined in each individual? The denial of instinct in any given case presupposes knowledge, accurate and certain, concerning the scope of its operation. Yet what is the extent of our knowledge of instinct as supplied by observation? Simply that, *in the conduct of any animal, faculties adapted to meet the ever-varying contingencies of its life are brought into exercise, agreeably with the scope of its physical powers and the chief ends of its being.* This is all. The means, the mediate causes, by which those faculties are thus brought into exercise are as far beyond the reach of observation as those which form the crystal, the flower, or the amoeba. Whether the scope of instinctive action be really commensurate with that of the physical powers with which it is conjoined in any individual animal—in other words, whether animals *are* rational—still remains to be considered. It is noteworthy, however, that all attempts hitherto made to restrict it within other and narrower limits, have resulted only in contradiction and confusion.

John Le Marchant Bishop.

VII.—CRITICAL NOTICES.

Logik. Eine Untersuchung der Principien der Erkenntniss und der Methoden wissenschaftlicher Forschung. Von Wilhelm Wundt, Professor an der Universität zu Leipzig. Erster Band. 'Erkenntnisslehre.' Stuttgart: Enke, 1880. Pp. 585.

Professor Wundt's volume contains plenty of matter, both in quantity and importance. A complete account of so large and many-sided a treatise would of course be impossible within the limits of a Critical Notice; and I can only hope to indicate a few of its main tendencies, sufficiently to enable readers to judge for themselves how far a perusal of this or that portion of the original might be of service

to them. And any criticism contained in the following remarks can only claim to represent first impressions produced by a very few months' acquaintance with a book which no doubt embodies the work of years, and which would require long and careful use to fully test.

The chief spirit by which Prof. Wundt's improvements in Logic are directed appears to be the aim at completeness. There are also, here and there, attempts at unification, but on the whole fulness rather than simplicity is the author's aim: the complaint which he has to lodge against traditional Logic is in nearly every case that of false or superficial simplification. This is observable already in the general position taken as regards the science, an attempt on the one hand to dispense with the easy method which the purely formal view adopts, namely, that of avoiding the ultimate difficulty by saying "Material truth is no object"; and on the other hand with the equally easy method of the "metaphysical or dialectical" view, that of saying in effect, "Come, let us construct reality out of the forms of thought: Thought and existence are one". *Scientific* thought, instead of starting from an assumed correspondence with reality, sets this up as the goal of its efforts, and "Scientific Logic" must do the same. Thus it will be seen that the task of Scientific Logic is considerably more complicated and difficult than that of either of the two systems between which it attempts to steer.

The same striving after completeness is also shown in Prof. Wundt's objection to the custom of singling out what is merely the most striking (or often only the latest in order of development) among many elements or among many various forms, and raising it to the position not only of representative—for this, I suppose he would say, occurs legitimately in the formation of every notion—but of being fundamentally the sole element of which the whole consists, or the one type to which all others must conform if they are to prove their right of existence. This complaint may be instanced chiefly by his attack on the ordinary plan of allowing the notion of Subsumption or Subordination to dominate every branch of logical doctrine. He combats this view on each of the three main fields,—the Concept, the Judgment, and the Syllogism,—substituting for it a variety of forms; and here it may be remarked that in every case the amendments must tend, however correct they may be, to introduce considerable complication in the practical application of logical doctrines.

The same spirit of completeness is to be seen also in another direction. One of the great merits, as well as the chief difficulty, of the psychological portion of the work is undoubtedly the extent to which the notion of Development pervades it. This might in fact be expected from an author who has done so much to systematise evolutional doctrines in Psychology. The mental processes involved in the formation of concepts, of judgments, and of conclusions, are not isolated acts easily arrangeable according to priority, but each is a growing process, liable to be found in any given stage of completion; and the difficulty consists in the fact that as soon as each begins to be far enough developed to clearly deserve its name, we find the different

processes more or less entangled and interdependent. The recognition of this fact is of course not altogether new, but I have met with no other book which comes so near to a consistent and at the same time intelligible exposition of it;—so *near* only, for although one cannot help feeling the reality and essential correctness of a view which tries to include the facts of growth in these processes, yet it seems undeniable that any really consistent attempt in this direction would interfere too far with language to satisfy the practical needs of intelligence. Human intelligence at least demands that if different names are to be applied to mark distinctions between different processes, we shall know clearly (or else assume that we know) where one process ends and another begins; and so far as we confess our ignorance of this, however real the ignorance may be, so far we surely tend to destroy the meaning of the names. Definiteness, as Prof. Wundt himself says in one place, is a logical postulate even where not in fact completely to be realised.

Attempting, however, to make the best of this difficulty, the following short account may sufficiently indicate in outline the course over which the author begins by leading us, in discussing the mental processes which lie at the foundation of logical thought.

The common view of Association as concerned only with such Presentations and Representations *(Vorstellungen)* as occur in succession must in the first place be enlarged so as to include the blending, into a complex product, of those which are given simultaneously; and on the other hand the name Association is to be restricted to combinations in which the "apperceptive" faculty plays only a passive part. Apperception is indeed always connected with Will, and is more or less concerned in all the various kinds of combinations; but a clear line may be drawn between active and passive apperception, the former occurring where the apperceptive faculty itself exercises a *choice* among the *Vorstellungen* offered to it, and the latter where its selection is determined merely by the degree or kind of stimulus which the various presented elements may provide: and this line is used to divide such combinations as are to be properly called apperceptive from such as are associative merely.

We get accordingly a cross division: *simultaneous* and *successive* Association, and *simultaneous* and *successive* Apperceptive Combination. Of the first of these, simultaneous Association, three forms are given: —(1) Associative Synthesis, or the formation of compound *Vorstellungen* through the blending of elementary[1] sense-impressions—whether homogeneous (in which case, since intensity alone determines the dominant elements, the synthesis is called "intensive": *e.g.*, in hearing,

[1] This of course proceeds on the assumption that all *Vorstellungen* which are recognisable are capable of being psychologically analysed into elements, though from the nature of the case these latter can never be found occurring independently. The assumption does not necessarily carry with it the further theory that these simple forms are identical with pure sensations *(reine Empfindungen)*, but stands to it in much the same relation as the assumption of Element in chemistry stands to that of Atoms.

smell, and taste), or partly homogeneous and partly heterogeneous (in which case the name "extensive" is applied: *e.g.* in sight and touch). (2) Assimilation, the blending of a newly appearing *Vorstellung* (A') with a former one (A) which is reproduced by it through similarity; and (3) a process which stands to the two above-mentioned somewhat in the relation of mechanical mixture to chemical combination, and is named (following Herbart) "Complication". In this the *Vorstellungen* —which belong always to disparate sense-departments, separate in space, enter into the combination as undivided wholes, fast bound together indeed, but each distinguishable: *e.g.*, the form and colour of a body with its hardness and roughness.

Of simultaneous Apperceptive Combination, three kinds also are given, the two first of which—"Agglutination" and "Apperceptive Synthesis"—are hardly distinguishable from each other, the only difference between them being the degree in which the separate elements are lost in the whole product. Agglutination in fact always tends in course of time to become apperceptive synthesis,—as may be seen for instance in the case of many words, such as 'Herzog' and 'Marschall,' which were originally compound but which have gradually lost all trace of their compounded meaning; while in other names, as 'Heerführer' or 'Dienstmann' this has not yet completely taken place. It should be noticed here that Prof. Wundt appears throughout fully to appreciate the value of language, historically treated, as at least a collateral security for his views on the natural history of logical thought. In fact, although 'local signs' and 'innervation' are occasionally referred to—as for instance the latter when speaking of the effect of habit in successive associations, or again the former in the section on the Intuition of Space—far more frequent appeals are made throughout to the history of language than to physiology. Thus, language is used as a witness for Assimilation, and again for the stages of development in Concepts, and again more than once in speaking of the relation between these latter and Judgments, and in the discussion of the Categories and their interchange; while in the section above spoken of, relating to appercceptive synthesis, there is an interesting discussion (pp. 31—37) on the changes which are always taking place in names and their meaning.

The third form of simultaneous Appercceptive Combination introduces one of the most important of all subjects in Logic, the Concept; its fuller discussion is reserved for later chapters in the book, but in this place we may notice that the apperceptive process by which Concepts are formed is taken to consist essentially in the blending of one dominant individual Notion *(Einzelvorstellung)* with a set of allied *Vorstellungen*. The Concept being in itself unpicturable must at any moment be represented by some one single *Vorstellung* of the set: the appercceptive faculty is first exercised on the selection of this representative, and secondly on the selection of some element or elements out of it, as dominant. The most important fact about the Concept, looked at psychologically, is that it sets several *Vorstellungen* in relation to each other. Accordingly the formation of Concepts is

closely connected with the development of the apperceptive "Stream of Thought".

Successive Association can always be clearly distinguished from the simultaneous combinations. There is no blending, but each single *Vorstellung* retains its own independent properties unaltered. It is, however, liable to be *interrupted* by a process of Assimilation or Complication; and it should also be noticed that the requisite passivity for a chain of pure association of any considerable length cannot often occur except in dreams, madness, and such-like cases.

Not so easy is it to distinguish simultaneous and successive Apperceptive Combinations: here there is a continual interchange between the two forms, the former always arising out of a combination which was originally given successively, while on the other hand the simplest forms of the latter unfold themselves through the dismemberment of a compound notion (*Gesammtvorstellung*).

Successive Apperceptive Combination (or the *Gedankenverlauf*) is essentially distinguished from successive association by the fact that while the latter runs straight on indefinitely ($A\ B\ C\ D\ \ldots$), the former is always a separate whole of which all the parts, though preserving their separateness, stand in a mutual connexion governed by the law of dual division: when only a single application of the law takes place, and the *Gesammtvorstellung* is accordingly divided into only two related parts, as $\overset{\frown}{A\,B}$, we get the simple judgment, while the compound forms result from a repeated application of the law, and may be symbolised:—

$$\overset{\frown}{A\ B\,C},\quad \overset{\frown}{A\,B\ C\,D},\quad \overset{\frown}{A\,B\ C\,D\,E},\ \&c.$$

Lastly, two or more of these *Gedanken*, or Judgments, may be themselves linked together. This also occurs either with active, or only passive, apperception, but it is entirely with the former case that Logic is concerned. Such combinations are again divided into simple and compound,—the former when only two judgments, whether themselves simple or compound, are combined; and the latter when more than two enter into the combination. In the forms of these chains and interweavings, all connected processes of thought, inductive or deductive, have each their own mode of expression.

The next chapter (Bk. I., chap. iii.) deals, in a preliminary manner, with the extremely difficult question of the bridge between Psychology and Logic. Between the psychological and the logical laws of thought there is, as the author himself says, an "indissoluble tie" which renders it no easy matter to make sure that when we are trying to speak of the one we are not really speaking of the other; and yet, on Prof. Wundt's scheme, it is necessary to face the questions—which of course the purely formal Logic avoids—how the logical as distinguished from the psychological laws of thought arise and whence they get their binding force. We have seen already that the Will is a considerable factor in all apperceptive combinations, but besides

"spontaneity"[1] there are two other qualities which are found in certain of the combinations of thought, and these are *Evidenz* and Universal Validity: since then we find certain of the combinations of thought already possessing these qualities, we erect them into the conditions of all *logical* thought. Logical evidence rests neither on the processes of thought, nor on the material with which thought works, but on its *results:* the security of the results of thought is the sole source of logical certainty. Evidence may be either immediate or mediate, but since mediate always presupposes immediate evidence we cannot possibly give proper account of the former without inquiring into the nature of the latter. Immediate Evidence has its source in Immediate Intuition, in the widest sense (thus by no means in space-intuition alone, as Lange would have it); yet this Intuition is not itself the evidence but only as it were the predisposing cause, the moving cause lying in the power which thought possesses of combination and comparison: still, there is no logical thought without Intuition. The connexion between immediate and mediate evidence is extremely close: in the former our thought combines elements which were immediately given in Intuition, in the latter it treats the combinations thus arising as themselves elements of further combinations, and as set in relationship to each other according to the intuited coherence which exists between them. Syllogism is in fact an amplification of the judging process; it rests on a comparison of judgments, just as the judgment rests on a comparison of notions: the same combining activity of thought lies at the root of both. In this way Intuition is the foundation of mediate as well as of immediate evidence. The doctrine of Concepts and of Judgments is concerned with logical thought in the form in which it rests on immediate evidence: the doctrine of Inference in the form in which it rests on mediate evidence.

Before proceeding however to discuss the doctrine of Inference it will be well to consider more closely the relation between the Judgment and the Concept. This is one of the points in which the difficulty noticed above—namely that introduced by the recognition of Development—makes itself felt; for however it may be with the earliest origin of "these two different forms of apperceptive process," yet as soon as they begin to be at all advanced in their development we find each helping forward the other's growth, each in a measure dependent on the other's help.

We must not, says Prof. Wundt, picture the development of thought as if Concepts first took shape, and then, existing separately, were afterwards put together into Judgments: but the starting-point is the *Gesammtvorstellung*, a product, as above explained, of simultaneous apperceptive combination. The content of the Judgment is first given as an undivided whole, and the Judgment proper does not arise until this is analysed[2] in our discursive thought. The word *Urtheilen*, he

[1] The question of the Freedom of the Will is not opened, *practical* freedom being sufficient.

[2] The explanation of the Judgment as (from one point of view) an essentially analytical process must not be confused with Kant's distinction of analytical and synthetical, with which it has nothing to do.

suggests, appropriately marks out the psychological process involved in Judging. In actual fact we are here concerned with "ein ursprüngliches Theilen der Vorstellungen": the Judgment separates the *Gesammtvorstellung* into its component parts, thereby carving Concepts out of it and setting them in relationship to each other.

Concepts are, then, "results of a process of cognition" and yet in a certain sense they are the elements of logical thought. Although their growth proceeds simultaneously with that of the Judgment, and although the most highly developed forms of them (those used in Science, and distinctly *not* metaphysical) presuppose all other logical functions, yet their least developed forms only, as it were, point out the place where such a result is to be obtained. Prof. Wundt would apply the name even to these less developed forms, distinguishing them however by the epithet "logical" as opposed to "scientific," since in them the definiteness and universal validity which are said to be respectively the subjective and the objective essential attributes of all Concepts, are only postulated, not by any means completely attained. Perhaps the best account given of the exact difference intended between the Concept and the Judgment is where it is explained (p. 50) that in the former only a single dominant *Vorstellung* stands out, while the simplest successive act of thought requires two: thus if we express the Concept by the formula hA, the Judgment should be expressed h_1h_2A.

Assuming, then, Concepts (or *Terms*, as it will in most cases be more convenient to call them[1]) as independently existing formations, the author next discusses the possible relationships into which they may enter, in the shape of Judgments, and the further combinations in which these latter may be put together to form Syllogisms.

As already mentioned, Prof. Wundt finds that the explanation of everything as subordination or subsumption plays far too large a part in the ordinary Logic. He finds traces of its influence everywhere, and his aim is always to show that the view given by it is superficial and incomplete. He sees it, for instance, in the constant attempt to find one most general and most abstract category which should include all the others: to it again he traces the doctrine that Concepts are merely sums of attributes, and along with this doctrine all its corollaries,—*e.g.*, that content and extent vary reciprocally, that the concreteness of terms depends on the number of attributes which they sum up, that abstraction consists simply in a removal of attributes; and he maintains that the 'extent' of a term has in fact no meaning except as applied to those which are really generic terms, and that even in their case the information conveyed in the above doctrines is not particularly fruitful.

In speaking of the Categories the author finds that those of Aristotle are not so casually raked together as Kant asserted; allowing however that, through confusing to some extent grammatical with logical dis-

[1] Even proper names are said to have a general meaning, since they refer to an individual in many different conditions.

tinctions, the Aristotelian categories are more numerous than necessary. He would reduce them to four[1]:—Object (οὐσία), Attribute (πόσον and ποῖον), Condition (κεῖσθαι, ἔχειν, ποιεῖν, and πάσχειν), and Relation (πρός τι, ποῦ, and πότε); only the first three of which, of course, correspond to 'categorematic terms,' the fourth being found in the shape of adverbs, prepositions, case-endings, tenses and moods, and being therefore properly speaking[2] not a category at all. In this connexion attention should be called to an interesting exposition (Bk. II., chap. ii., sect. 2) of the manner in which, in order to meet certain needs of thought, the category to which any given term belongs can be changed,—so that, in fact, in the case of the more abstract terms it often becomes hard to say what their original form was. Through this "shifting of the category" there is, says Prof. Wundt, a gradual increase in the number of Object-terms; for whatever can be thought as a term at all can if required be made into an object, while the opposite movement (from objects into attributes or verbs), though also to be found, is, he says, of comparatively little importance. Even in the earliest beginnings of language, ever since the period of Roots, the same tendency (towards increase in the number of Object-terms) is observable, and its importance throughout lies in the aid which it gives to all abstract thought.

The view here taken of Abstraction demands also some notice. The process of Abstraction is said to consist, not in a subtraction of attributes but, in a fixing of relations which our thought finds amongst the elements presented to it. Every notion consists of elements which enter also into more or less numerous other notions, and it is the particular mixture and manner of combination of these which alone constitutes the essence: we put the notion together out of those relations which appear to our thinking essential. The proper distinction between Abstract and Concrete is given as turning on the question whether or no an *adequate* (*i.e.*, perceptible by the senses) "representative *Vorstellung*" is to be found: 'man' or 'beast,' for instance, remains—as under the Scholastic distinction—concrete: 'humanity' also remains abstract: but on the other hand 'just men' becomes an abstract term as much as 'Justice'. The author claims that this distinction helps to explain the growth of the abstract meaning out of the concrete, and the fact that the very same word may be at the same time to one person abstract and to another concrete: and it may further be noticed that such a distinction agrees, far better than the old one, with popular usage.

Having mentioned these few isolated points connected with terms when regarded independently, we pass to the relations which may exist between them, to the expression of such relations in the form of Judgments and the binding together of Judgments in the form of Syllogisms (Bks. III., IV.).

[1] Following here almost precisely the same lines as Sigwart and Lotze.

[2] *I.e.*, if we mean by the 'categories' the most general classes of independent terms.

Here, the two chief intentions of the author appear to be,—(1) to distinguish a variety of forms both of Judgment and Syllogism, thus avoiding as far as possible any reduction to one pattern, whether categorical, hypothetical, or disjunctive, and especially to combat the rather crude explanation of everything as subordination or subsumption; and (2) to express in syllogistic shape the attainment of new truths as well as the establishment of the consequences of what has been already admitted.

As regards the first of these points, Prof. Wundt is clearly in the right, so far at least as purely scientific purposes are concerned, although he seems rather to neglect the value—one might almost say the necessity—of simplification (even if to some extent forced or fictitious) in these matters for purposes of practice, and to overlook the possibility that it was the desire to render the science practical, rather than mere incompleteness of view, which has led to the prevalence of the treatment which he attacks. He admits its value, indeed, for certain purposes, but thinks that on the whole it does more harm than good, —chiefly on account of the number of cross-classifications which must follow from it, and which thus hinder rather than help any orderly arrangement. He says nothing however about the far greater ease with which errors may be detected when the meaning of propositions and syllogisms is simplified as far as possible, at the cost perhaps of a little artificiality or clumsiness of expression, or even of a total loss of that part of the meaning which is irrelevant to the immediate purpose in hand. Accordingly Prof. Wundt would distinguish carefully those judgments whose real primary intention is to classify in genera and species from those to which for merely temporary purposes the form of subsumption may be given :—"the Judgment of Subsumption is in the real order of development the latest of all, and hence it is obvious that only a small number of the needs which the judgment should satisfy can be covered by it". And he is equally dissatisfied with subsumption as the foundation of syllogistic doctrine, and on much the same grounds, superseding it by a variety of other forms, of which it may be said that they at any rate show great care in attempting to recognise and distinguish all the different purposes for which syllogisms can possibly be used.

As regards the second point, the expression of Inductive Inference in syllogistic forms, it seems to me that the chasm between necessary (in the sense of 'already admitted') truth, and the kind of 'necessary' sequence which a successful observation of nature may give us, is only too easily leapt both in common life and in Science, and that Logic ought above all things to recognise its depth and importance, and to preserve every barrier which has already been erected there. The ease with which the leap is made is a result, no doubt, in most cases, of some confusion between the purposes of proof and new induction; and such a confusion cannot altogether be laid to Prof. Wundt's charge[1]: the only question is whether this treatment, by which induc-

[1] Some passages, however, might almost justify the suspicion. See Note on p. 420 *infra*.

tive syllogisms are exhibited side by side with deductive ones and thus gain an appearance of being on an equal footing with them, does not tend to increase a danger which is already great enough. The inclination to convert propositions simply, without any warrant beyond the ease with which the formal process can be accomplished, is always so strong that any arrangement of the subject which may act as a check on this tendency has advantages which ought not to be overlooked.

Both these points, however, readers will be better able to judge after having seen something of Prof. Wundt's arrangement.

Since the establishment (predicatively,—by means of the copula) of a relation between any two terms must always take the form of a Judgment, an inquiry into the possible relations between independent terms lies at the root of the doctrine of the Judgment. Other divisions, such as that into indefinite, singular, and plural judgments, or again into narrative, descriptive, and explanatory, though required for some purposes, are of minor importance; while the usual A E I O distinctions are to be superseded altogether, the division into universal and particular as acquiring whatever importance it possesses merely from the ambiguity of the word 'some,' and that into positive and negative as tending to preserve erroneous views on the subject of negation.

These relations then (which, by the way, the author prefers to represent by means of a straight line divided into sections, rather than by means of circles,—on the ground that circles can only represent subsumption[1]) are six in number: four "definite," and two "indefinite". The first two of the definite relations, Identity and Subordination, and also the judgments which correspond to them, and the syllogisms of Identity and Subsumption[2] need not be more than mentioned here, since beyond a very clear and complete exposition of the different varieties of these and especially of the different purposes for which they are respectively applicable or commonly applied, there is nothing which particularly calls for remark.

Co-ordination is taken as including (*a*) Disjunction, (*b*) Correlation, (*c*) Contrary opposition, (*d*) Contingence, and (*e*) Interference: of these however, only the first two have special forms of Judgment corresponding to them,—the disjunctive and the alternative: and such judgments find their chief application in special forms of the third class of syllogisms (conditionals).

For the fourth of the "definite" Relations—that of Dependence—great importance is claimed, and the author's Axiom of the Syllogism[3] appears to be specially framed in order to give prominence to it.

[1] It may be questioned whether any figure can really avoid this objection, since all figures of whatever shape must necessarily represent *extent*. The point is however perhaps not of very great importance.

[2] Except as regards the syllogisms of Probability and Analogy, which are included under those of Subsumption, and which must be slightly mentioned later.

[3] It would be more correct to say, the fuller explanation which he gives of the somewhat useless Axiom "Mit dem Grund ist die Folge gegeben".

Rejecting the *Dictum de Omni* (and Lambert's additions of *Dicta de Diverso, de Exemplo*, and *de Reciproco*) as being only applicable to syllogisms of subsumption, and rejecting Kant's formula and the *Nota notæ* as being not even applicable to all of these, and rejecting further the principle of Substitution as being itself no principle but merely a process resting on the principle of Identity, he gives us the General Principle of Relation—"When different judgments are set in relation to each other by means of terms which belong to them in common, then those terms in the said judgments which are not common to both also stand in a relation to each other, which may be expressed in a new judgment." The relation of Dependence, the author complains, has been almost entirely neglected by logicians, and yet it is one of the most wide-reaching and universal of all. Two kinds are distinguished,—one-sided and mutual: Space and Motion may illustrate the former, Law and Custom the latter. The judgment, however, "Motion is dependent on Space" would not by itself contain very much information, and accordingly the function of the "Judgment of Dependence" is, by introducing other terms which also enter into the relation, to express as far as possible the *kind* of dependence intended: thus, we define Motion as "change of position in space," or still better we express the relationship in a compound judgment, as "An object moves when (or if) it changes its position in space". Among the forms then which these Judgments of Dependence take, the conditional or hypothetical are the most frequent and important, although here again Prof. Wundt remarks that this most lately developed form should not be allowed to throw the older ones completely into the shade: accordingly, "local" and "temporal" dependence have also a place in the class, the kind of dependence being of course marked by the particular conjunction used,—*e.g.*, 'where' or 'when'; and under conditionals proper are distinguished four minor kinds,—the *Begründungsurtheil* ('if' or 'because'), the *Beschaffenheitsurtheil* ('as' or 'that'), the *Zweckurtheil* ('what . . . for' and 'in order that'), and the *Urtheil des Hülfsmittels* ('wherewith').

It is a relief to find however that not all of these are to be employed in the formation of special kinds of syllogism: besides the syllogisms of Identity and Subsumption, there are only two more main classes,—"Conditional" and "Relational"—the former being subdivided into "verifying" and "subsuming," the latter into "comparing" and "connecting".

It is unnecessary to follow all the syllogistic forms out in detail. Both the last classes again show immense care in recognising the different purposes for which the different forms are useful: but the weak point of the treatment consists in the fact that amongst Conditional Syllogisms the familiar formal fallacies of 'affirmed consequent' and 'denied antecedent' are allowed a footing (with their conclusions vaguely qualified as '*probably or certainly*'), and that of the greater number of Relational Syllogisms the most that can really be said is that the desired (or guessed) conclusions are—like those just mentioned—not absolutely excluded by the premisses; the remainder being

cases where, although there is no formal fallacy, the conclusion is left so indefinite that unless taken for more than it is literally worth it is practically useless.

It must be said that so far as the avoidance of error is one of the purposes of Logic the treatment here employed is open to objection. One of the commonest causes of error is the confusion of the very distinction which this arrangement tends (however intentionally) to obliterate, namely the distinction between truth which is being inferred, and that which is already admitted: and the inevitable result of any tampering with this distinction is a considerable vagueness as to the kind (or more strictly the *conditions*) of certainty properly attaching to the conclusion. The fact that forms of Inference which, if expressed syllogistically (as all *can* be), would take the shape of Undistributed Middle, or Illicit Process, are perfectly valid, or are a useful—or even essential—element both in Science and in common life, is surely well-recognised by everyone who has advanced beyond a very early stage in Logic: but after all, Syllogisms which violate the old rules give a totally different kind of certainty in their conclusions from those which comply with them,—a kind of certainty perhaps no lower ultimately, but the real testing of which is to be accomplished on a different field. Of course Prof. Wundt himself to some extent recognises the distinction, in fact indirectly calling attention to it in more than one place[1]; but many expressions point the other way[2], and the whole arrangement of the subject tends to minimise it, not only through appearing to bridge the gulf between Induction and Deduction, but through drawing a hard line between Syllogism and Immediate Proof (which he calls "Transformations of Judgments").

Again, the language used in describing these Inductive Syllogisms is sometimes distinctly misleading. We find for instance given (p. 318) as a "completely binding" argument, the following:—"If the Earth turns on its axis, falling bodies must diverge from the perpendicular; now, the experiment shows that they do so diverge; therefore the Earth must turn on its axis". Of course we also find it admitted, not only beforehand but again a little lower on the same page, that the truth of this conclusion depends on the existence of mutual determination between antecedent and consequent in the first premiss: what renders the above argument valid, in short, is a fact not stated in its premisses but guessed in addition to what they strictly assert,—partly perhaps by means of them, and partly also by means of extraneous considerations. Had the argument run:—"If falling bodies, &c., the Earth must, &c.; now falling

[1] *E.g.*, at the top of p. 323; and again in the symbolical part, where the "ambiguous" syllogisms are fully set out, and we find some admitting of four, five, or even seven different conclusions.

[2] *E.g.*, in addition to the passages incidentally mentioned in this notice, the definition of Inference as the *arising* of new judgments from old ones; or the statement (p. 288) that no fundamental difference can be established between deductive and inductive reasoning.

bodies do, &c.," it is clear that, in order to test the truth of the conclusion we should merely have to inquire into the truth of these two premisses: while Prof. Wundt's argument, however binding it may be, compels us, in order to test the truth of its conclusion, to investigate in the first place a very different question: after which we are exactly in the position last above set out, and can then proceed as usual. In other words the binding force of the argument given by Prof. Wundt consists in the truth of a fact which will enable us to state the premisses so as to avoid the formal fallacy which, in the shape given by him, they bear on their face. And the same objection appears to me to lie against every attempt to range side by side syllogisms which break the ancient rules and those which obey them. Wherever the author's Relational Syllogisms escape committing a formal fallacy, as (p. 324) "A has the attribute M, B has the attribute M, ∴ A and B agree in one attribute," it is needless to say that the result is exactly as barren for purposes of *discovery*, as any of the "meaningless logical artefacts" to which he objects (pp. 300-302), while for purposes of proof the latter stand on exactly the same level as this. On the other hand, whenever we do as a fact employ for making a real inductive leap forms resembling those whose proper function is proof, there, along with this resemblance, must always be found this one point of difference—that such forms are not themselves unambiguously valid until, by means of some further considerations, we have the liberty to convert them into the shape that is formally correct. Would it not be simpler, and less liable to mislead, if we continue to recognise the unambiguous form—namely such that whatever is asserted in the conclusion must be asserted by implication in the premiss or premisses—as essential for all proof (or *retrospective* inference), whether mediate or immediate, and as essentially distinct from *advancing* inference by that very fact?

It should be noticed further that although Prof. Wundt recognises the problematical character of his Relational Syllogisms (where they amount to an expressed induction), he draws a distinction between these and the Syllogisms of Probability and Analogy—in which of course also a qualified conclusion is obtained,—ranging these latter under the Syllogisms of Subsumption. Probability in the proper sense of the term, he maintains, occurs only where the doubt really lies in the major premiss, which mentions a number of cases as possible, with a certain balance in favour of one or more; while Syllogisms of Analogy are those where the doubt lies in the minor premiss, the object or class spoken of being only more or less *like* that which constitutes the middle term. It is hardly necessary to add that the Probability-syllogisms so far as unnumerical, and the Analogy-syllogisms altogether, lie open to exactly the same objections as have been already raised.

The two "indefinite" relations,—simple Negation[1] and Disparateness

[1] As distinguished both from contrary opposition and from contingence: nearly the same as what is usually understood by contradictory opposition, but more limited.

—contain some points of interest. In the former the positive term is definite, while the negative remains indefinite but is limited and not taken as the whole remainder of the universe,—not even as the whole remainder of the 'universe of the proposition': thus, in the linear representation the positive term would be some one portion of the line, say A B, and the negative would be any *one* other portion, say E F, of which the exact position is undetermined but which in most cases lies near the opposite extremity.[1]

Corresponding with these two relations we get a useful distinction in negative judgments, the former giving us the "negatively-predicating" judgment, where, in a grammatically negative shape, some more or less definitely conceived positive assertion is made (*e.g.*, The orang-outang has no hair on his face); and the latter giving us the "denying and dividing" judgment, where we simply state our inability to predicate either term of the other (*e.g.*, Silver is not lead). It will be seen that this distinction helps to reconcile the disputes as to which part of a proposition contains the negation, since in the former class it belongs clearly to the predicate, and only in the latter to the copula, the latter being convertible without loss of meaning, while, if the former are to keep their meaning under conversion, changes in the structure must be made.

Books V. and VI. (on the "Fundamental Conceptions" and the "Laws" of Knowledge) contain so much that is interesting, and range over so wide a field, that it is impossible here to give even a bare outline of them. In both, along with Prof. Wundt's own views, there is a good deal of very clear and concise history given of the various opinions held on the leading questions from earliest times: as instances of this may be specially mentioned the chapters on Causation and Design, and also the chapter on Substance.

As regards the author's own views, the notion of Development again frequently shows itself, though here its application is of course somewhat different and it consequently introduces less difficulty than in the earlier portion of the work. And, as before, the part assigned to the Will is important, especially (*e.g.*) in its connexion with the discussion on the Thing-in-itself, with "Logical Causality," and with Error and Truth. The relation of his three categories—Object, Attribute, and Condition—to inner and outer experience, is also very carefully set out and explained; and the Forms of Intuition receive a full treatment, as also the various sets of Axioms,—logical, geometrical, arithmetical, 'phoronomical', and physical. In the chapter on Causation great pains are taken to keep the distinction between the physical and the metaphysical interest clear, and also that between the principles of Causation and Design, and again that between Cause and Reason; and the author lays considerable stress on the view that causes as well as effects are to be conceived (as far as possible) as *events*, or processes occupying time, not as things.

[1] Of course the fewer the members of disjunction, the more negation loses its indefiniteness: and in Mathematics for instance, where negative and positive mean simply subtraction and addition, each is equally definite.

The section (Bk. V. 1) on Facts and Hypotheses, and on the correct and incorrect use of the latter, is particularly interesting and useful. There are one or two points which seem to call for a few special remarks.

As to the criterion of objective certainty: instead of starting from the primary subjectivity of all perception, and then seeking for marks by which to distinguish the merely subjective elements in it from those which have both a subjective and an objective side, he suggests that the only true criterion is to be found by following the method of the separate sciences, by reversing the above process, starting with the assumption of the objectivity of everything which is perceived, and gradually eliminating one element after another as "purely subjective,"—the residuum giving us not merely the nearest approach to objective certainty that we can at any time possess, but in many cases an objective certainty which is theoretically as well as practically perfect. Everyone must admit that some such method is the only practically sound one; but why attempt to disguise the fact that it is a begging of the question, or to draw a distinction between the "certainty" so reached, and high probability? The fact that the Earth moves round the Sun, says the author, is *certain*, because we have found that every supposition which contradicts it is not only improbable but impossible. Surely only a finite number of contradictory suppositions have been examined, and the supposition that these are all that can possibly exist is, however practically valid and useful, theoretically a leap in the dark? For all practical purposes it may be "objectively certain" that the phenomena will never be explained by the fact that, while neither Earth nor Sun really moves, our senses somehow delude us into thinking so: but wherein lies any absolute impossibility in some such delusion? The proposal to drag into the realm of objective certainty (in any sense except that of 'practical') all supposed facts against which no sound *definite* objection can be thought of, can only be called an attempt to shift the burden of proof off the shoulders of those who make the assertion; and if this were allowed to pass, we might be logically compelled to admit also (*e.g.*) that Whately had successfully defended the "objective certainty" of some well-known dogmas which by no means everybody is to-day able to consider even practically certain. It seems to me, too, that the author while allowing that the future always introduces an element of uncertainty, fails to recognise the future element that lies hidden in every assertion which claims to be in any way verifiable. The assertion, for instance, that the Earth turns round, even if taken quite apart from the *direct* future reference which is probably always included in it,—even if restricted in its direct meaning to the immediate present and an indefinite past,—yet claims to be (practically) verifiable; and since verification, however often repeated, is a process taking time, so before we begin the process, or begin its latest repetition, its end and result must lie in the future: and in the fact that we may always repeat, at intervals through all future time, old verifications that were believed to be secure, and may thereby sometimes get a different result,

lies the one speck of uncertainty that remains in every assertion, even after the completest possible 'verification' of it has been (for this time) successfully conducted.

So far as this portion of Prof. Wundt's work may be intended as an answer to Scepticism, I think it may be predicted that Sceptics—those at least who keep strictly to their own unpractical territory—are no more likely to be satisfied by it than can believers in the comparative value of Science be converted by Mr. Balfour's recent clever statement (in *Philosophic Doubt*) of the case for the other side. Both these authors seem to expect in human beings a closer correspondence between theory and practice than is really to be found; and, on the strength of this plausible but unsafe expectation, both invade ground which does not belong to them. Mr. Balfour, that is to say, seeing that the scientific man is theoretically in no better position than the systematically unscientific, would therefore deny him the right of deriding the latter in matters of practical interest (such as, the statements made by Theology as to matters of fact); while Prof. Wundt, seeing that judged by practical results the scientific man is in a much better position, seeks (also unduly, as it seems to me) to prevent the Sceptic from indulging his taste for stating uncomfortable, but practically harmless, facts. In the presence of all the acts of useful self-deception which help to make the world go round, may we not admit that Theory and Practice cannot as yet be safely presumed to coincide?

ALFRED SIDGWICK.

Der thierische Wille. Systematische Darstellung und Erklärung der thierischen Triebe und deren Entstehung, Entwickelung und Verbreitung im Thierreiche als Grundlage zu einer vergleichenden Willenslehre. Von GEORG HEINRICH SCHNEIDER. Leipzig: Abel. 1880. Pp. xx. 447.

This is a valuable contribution to animal psychology. The author aims at giving a complete survey of animal actions, classifying them, and interpreting them according to one or two psychological principles. Herr Schneider is a disciple of Darwin and Haeckel, and appears to have been encouraged by the latter in developing his line of research. He felt dissatisfied with the current conceptions of reflex, instinctive, and voluntary actions, and wished to reconsider the whole subject of animal life on its active side. In order to do this, and to do it in the spirit of the evolution-philosophy, he determined to carry on a series of carefully planned observations on the movements of the lower marine organisms. This object he accomplished partly in the island of Crete but mainly in Naples where he remained five years. Having encountered certain difficulties at the hands of Dr. Dohrn, who founded and presides over the Zoological Station at Naples, the writer reflects upon the way in which Dr. Dohrn uses the subsidies granted him by the German Government. Yet in spite of obstacles Herr Schneider was able to collect a goodly number of facts, the incorporation of

which into his volume lends it an additional interest and scientific value.

By selecting the special subject of animal actions Herr Schneider appears to deal with the most patent aspect of the mental life of the lower animals. At the same time it is clear that to classify and interpret the movements of these organisms some ideas must have been reached respecting the intellectual and emotional phenomena with which they are connected. In point of fact Herr Schneider has to devote a chapter to the Feelings and their classification. He does not separately discuss the question of the differences in intellectual operation in the various grades of animal life, though it may be said that his treatment of the problem of animal actions throughout assumes certain well-marked differences of intellectual power. One cannot help thinking that the whole subject would have been made clearer by a preliminary survey of these differences as based on comparative anatomy and the doctrine of evolution. This is the more desirable since what Herr Schneider chiefly aims at is to upset the notion that similar actions in different regions of the animal scale necessarily imply the same mental antecedents. The author works at a distinct disadvantage throughout in not having made the acquaintance of Mr. Herbert Spencer's systematic review of psychical phenomena. He appears to think that his present volume is the first attempt to trace comprehensively the gradual development of animal will in connexion with that of animal intelligence. So far as the "explanation" of these actions is concerned the work is not new. What is new is the painstaking and exhaustive bringing together and classifying of the various kinds of action.

The volume opens with what may easily strike the reader as an unnecessarily long discussion of the ideas of Ends and Adaptation. The supposed mystery of adaptation to some purpose is got rid of by saying that it is only one out of an infinite number of possible cases. Passing to his proper subject the author has an interesting chapter on Instinct and Will, in which he protests against the sharp separation of the two. On the one hand instinctive actions are conscious, like voluntary ones, and performed under the pressure of some feeling and active impulse *(Trieb)*. On the other hand the so-called voluntary actions of men are aided from the first by impulses, such as those which appear in children's play, which are clearly instinctive. Even the highest manifestations of will may be regarded as in part instinctive, if by instinct we mean the impulse to an action the final end of which is not consciously represented; for the one end of all actions is preservation of the species, and this is really never the aim or motive in volition. It is an added error to confine the term volition to human actions seeing that memory, ideation, and conscious purpose are shared in by all the higher animals from the cephalopods upwards.

A chapter on Feeling resolves all varieties into pleasures and pains, which must be regarded as subserving in some way the great end of organic life, the preservation of the species. If we classify feelings according to their height in the scale of organic evolution we must

distinguish between those dependent on and excited by sensation, perception, ideation, and thought. Each of these groups falls into four sub-classes according as the actions with which the feelings are connected are those of procuring food, self-defence, reproduction, or rearing the young. Besides these feelings which are called "direct feelings of preservation" there are others termed "indirect feelings of preservation," namely the æsthetic and social feelings.

Feelings of Sensation are nothing but the sensations themselves, for in this lowest stage of psychical life there is no differentiation of the emotional and the intellectual states. By a Feeling of Perception is meant one excited by an object, by direct contact with it and stimulation of the nerve, and not by means of an idea or mental representation suggested by the object. Thus fear may arise in an animal at the presence of an enemy quite apart from any idea of impending harm. Such conjunctions of certain perceptions and certain feelings might arise solely by means of natural selection, though it is probable that association has had most to do with their development; that is to say, the pleasures or pains experienced with actual contact, or as sensations, come, in the case of animals endowed with organs of perception, to be suggested by the objects when only perceived. In the case of a proper feeling of perception, however, as distinct from one of ideation, there is no distinct representation of these experiences, and the genesis of such direct emotional accompaniments of perception is accounted for partly by association, partly by the effect of habit and inheritance on feelings once belonging to those of ideation. By a Feeling of Ideation the author means one which depends on the representation of some sensation or perception. Such feelings arise through association when the power of representing sense-experiences, either with or apart from a present perception, is developed. Finally a Feeling of Thought is an indirect feeling of ideation in the same sense as this last is an indirect feeling of perception. These feelings include all that are excited by a sequence of ideas answering to a causal connexion between facts, of which the first is in itself indifferent and only excites a feeling as leading up to the final idea, that is the end desired. Speaking roughly, one may call the lowest animals up to the inferior molluscs sentient animals, the superior molluscs and articulata percipient animals, the vertebrates exclusive of man ideating animals, and man a thinking animal. The evolution of this scale of feeling is referred to the principle of the "gradual facilitation of the process of discrimination and the genesis of the feeling": that is to say in each successive stage the feeling is excited less directly and by help of a less powerful exciting cause.

Through the peculiar structure of the nervous system sensory impressions act as stimuli to the motor organs. The active impulses correspond to the feelings. To the opposed feelings, pleasure and pain, answer the opposed impulses, desire and aversion. And to the fourfold division of the feelings given above there corresponds a fourfold division of Impulses, Sensational, Perceptional, Ideational and Rational or Reflectional. The two former correspond roughly to 'instinct,' the two

latter to 'volition' in the narrow sense. Similarly these Direct Impulses are supplemented by Indirect, answering to the indirect feelings of preservation. Finally there are certain auxiliary impulses which modify the course of the movements, namely the Impulse of Sequence, and that of Association. By the former is meant the tendency of actions habitually performed in a certain succession to recur in the same order; by the latter, the tendency of actions simultaneously performed to recur together.

The rest and largest part of the volume is occupied with a detailed exposition and illustration of these different classes of impulse. There is no space here for a complete summary of this interesting part of the work. A remark or two on some of its most striking points must suffice.

The author in dealing with the most elementary stage of impulse, that depending on actual contact of object and organism, and sensation, is careful to define and limit the range of reflex action. He thinks with G. H. Lewes that many actions have been too hastily set down as reflex, and argues that the rapid sequence of sensory stimulation and movement is no proof of unconsciousness. Even if we allow that the actions of a decapitated frog are now performed without feeling, it is an error to reason that they must always have been so performed; and the author leans to Lewes's opinion, of which, however, he seems to have no knowledge, that the spinal column may be a centre of sensation in the lower vertebrates. By adopting this view of the so-called reflex actions we are able to bring them under a wide definition of Will, making them the starting point in the evolution of the higher and commonly recognised voluntary actions. For wherever there is sensation or feeling there is motor impulse; and, owing to the inherited nervous structure of animals, particular classes of sensations serve as instinctive impulses to certain appropriate kinds of action. In dealing with impulses of perception Herr Schneider argues effectively against Von Hartmann's notion of animal clairvoyance, and shows there is not the least mystery, on the theory of evolution, in a direct succession of an impulse of desire or aversion on the presentation of an object, apart from any representation of the end to be realised thereby. Most of the much admired instinctive actions of insects are regarded as the outcome of perceptional impulses. And just as in the case of the feelings, so in that of the active impulses indissolubly connected with them, the ideational stage tends by the law of repetition and habit to pass back again into the perceptional.

The filling in of the details of the plan here described is carried out with great thoroughness. So far as I know there has never been any systematic grouping of all the known animal actions and habits at all comparable with this in comprehensiveness, clearness of arrangement, and psychological insight. The reader will not fail to admire Herr Schneider's general caution in determining the character of a particular action, as resting on an ideational or perceptional impulse, and so on. As he more than once says, in criticising every single action of an animal we must consider all the other parts of its life, and the stage

of psychic evolution to which it belongs. Thus the preparing of pit-falls by the ant-lion and the armadillo, though in appearance similar actions, must be interpreted differently. A consideration of the general psychical character of the classes to which these species belong leads us to infer that while the armadillo works by help of representation and reflection, the ant-lion does so by help of perception and sensation only. With respect to the main purpose of the book, the determination of the nature of instinct in relation to volition in the narrow sense, the author is to be congratulated on having attained a large measure of success. Some of the instinctive actions of animals low down in the scale may still remain a matter of great doubt. But by following out Mr. Darwin's idea and regarding the so-called instincts as partly the result of sensori-motor arrangements fixed by natural selection together with association, partly the result of habit acting on actions once ideational, Herr Schneider has done much to clear up the mystery of the subject, and at the same time to provide a sound basis for the development of animal will as a whole.

JAMES SULLY.

The "Method," "Meditations," and Selections from the "Principles" of DESCARTES, translated from the original texts. Sixth Edition. With a new Introductory Essay, Historical and Critical. By JOHN VEITCH, LL.D., Professor of Logic and Rhetoric in the University of Glasgow. Edinburgh and London: Blackwood, 1879.

The distinguishing characteristic of the present edition of Professor Veitch's *Descartes* is the Introductory Essay, extending over 181 pages, and embodying—besides historical and expository matter—examinations of the most notable recent discussions on the Cartesian positions. The old truths are presented in a fresh form; there are omissions, amendments, and additions, as compared with former Introductions; and by no means the least remarkable feature are the vigorous and trenchant criticisms, which always command respect even when they do not produce conviction. It is only a sketch, but so thorough and able in its way that one may be allowed to hope that we have here the forerunner of something more elaborate.

After opening with a brief account of the life and writings of Descartes, Prof. Veitch notes in a few succinct paragraphs the influences at work during the 15th and 16th centuries—"the volcanic epoch in European thought"—in preparing the way for the Cartesian advent. These influences, in great measure brought into play by the Renaissance, may be regarded as of four kinds. They were partly literary, partly speculative (as exemplified, for instance, in the philosophies of Bruno, Vanini, Campanella, and Ramus), partly observational and experimental (as seen in Copernicus, Kepler, Galileo, Bacon), and partly religious (manifested in the mysticism of the earlier, and the reforming spirit of the later, century). Emphasis has also to be

placed on the unprogressive nature of Scholasticism itself, and on the fact that, at the time of which we speak, its "inner spirit had pretty well worked itself out". The writer's own words may be quoted here:—"It was a body of thought remarkable for its order and symmetry, well knit and squared, solid and massive, like a mediæval fortress. But it was inadequate as a representation and expression of the free life that was working in the literature, and even in the outside nascent philosophy, of the time. It was formed for conservation and defence, not for progress. New weapons were being forged which must inevitably prevail against it, just as the discovery of gunpowder had been quietly superseding the heavy panoply of the knight."

The way for the exposition being cleared by these preliminary paragraphs, the start is now made (and naturally so) with the *Cogito ergo sum;* the handling of which extends over three sections (iii.-v.), and constitutes, to our thinking, one of the best parts of the Introduction. Section iii. treats of the nature and meaning of the principle; Section iv. of certain objections to it, and Section v. of its guarantee.

With respect to the first of these, Professor Veitch clearly shows—partly by appropriate quotations, and partly by sound reasoning—that the dictum is to be regarded, not as a syllogism, but as a proposition—a proposition intuitively apprehended: as he himself says, "it is what we should now call a proposition of immediate inference—such, that the predicate is necessarily implied in the subject." But if this be so, it would seem to follow that the *ergo* is a mere meaningless appendage: as Professor Huxley puts it, it has no business there. This, however, Dr. Veitch stoutly denies. He calls that view a "misrepresentation," and asserts that an immediate inference is still an inference. His words are:—"The 'therefore' has business there, as seems to me, until it is shown that immediate inference is no inference. The 'I am' is not assumed in the 'I think,' but implied in it, and explicitly evolved from it." Plainly the argument turns upon the word 'imply' here, and we must ask, What does that word signify? It cannot be identical with 'presuppose,' for it is part of Professor Veitch's case that the *cogito* of Descartes is in knowledge prior to the *existo;* the one does not 'assume' the other. Is it then synonymous with 'include' or 'contain,' so that the dictum, being interpreted, would run:—'My consciousness includes or contains my existence; just as a whole contains its parts, or a genus its species'? Then, in that case, 'my consciousness' and 'my existence' are for the moment convertible terms, and certainly the *ergo* has no business there. Or does it mean that the *sum* is only a part of what is contained in the *cogito?* Then it may be asked—Why is this part singled out rather than any other? Or, once more, does it signify, as Professor Veitch further on maintains, that my consciousness *reveals* my existence? Then the *ergo* is not illative at all, but instrumental, and the idea of 'evolving' is obviously inapplicable. The truth is, that there is a certain incompatibility between the terms 'imply' and 'evolve' on the one side, and 'immediate inference' and 'intuitively

apprehended' on the other; and only confusion results from the attempt to combine them.

This is still further apparent when we come to Professor Veitch's treatment of the objections. These, considered in his fourth Section, are mainly three:—Mr. Matthew Arnold's, Professor Bain's, and the old objection that the mind of man thinks always. The first is dismissed in a single paragraph; there is a rather elaborate handling of the last; but it is the treatment of the second that is unsatisfactory. Professor Bain had said that 'existence' standing by itself is a non-connotative term; or, to put it in the concrete form, that 'my existence' is an elliptical expression, and signifies nothing unless we unfold it and say—'I exist as a definite and precise something'. He had resolved 'existence' into some of the other attributes of things, and in particular he had referred to causation; he had maintained that 'I exist' is fully expressible by other terms, and is in reality intelligible only when translated into these. Now nowhere is this, so far as we can see, fairly met. There is much said on the alternative renderings, which Professor Bain himself regards as not expressing the thing intended, but nothing that runs face to face with the main issue. Moreover, there is a slight misrepresentation. When Professor Veitch, speaking of the *sum*, says:—"There is a twofold objection—one, that it is not a real inference; the other, that it is not a real proposition. It seems odd that it can be supposed possible for the same person to object to it on both of these grounds,"—he scarcely states the case correctly. What Professor Bain (to whom he here refers) regards as an unreal inference (See MIND, VI., p. 263) is the *sum* from the *cogito;* what he regards as an unreal proposition is the *cogito*, not the *sum*. And his object, as he says, for putting it in this way is, that thereby he may 'illustrate further the illogical character of the whole transaction'. It is scarcely strange that Professor Veitch should somewhat miss the mark in this controversy when he allows himself to confound "a real proposition" with "what is essential to a proposition"—two entirely different things.

Section v. introduces us to the guarantee of the principle. It may sound odd to speak of a guarantee for a principle that is intuitively apprehended; but we are relieved to find that, after all, the principle is its own guarantee; or, to phrase it differently, the guarantee is "intuition regulated by non-contradiction".

An admirable Section follows on the Criterion of Truth, in which we notice particularly the short vigorous criticism of Spinoza's 'Determination is negation'—the first sounding of a war-note that is heard again. Of the criterion itself the writer says:—"The most liberal, and probably the fairest, interpretation of the criterion of Descartes is that it is the assertion of the need of evidence, whatever be its kind, as the ground of the acceptance of a statement or proposition. As such, it is the expression of the spirit of the philosophy of Descartes, and of the spirit also of modern research."

Passing over the next three Sections, which treat respectively of "The Ego and the Material world," "Innate Ideas," "Malebranche,"

we enter at Section x. on that part of the Introduction which, next to the discussion of the *cogito*, will have the greatest interest for many, and which appears to us to be not only an opportune but a very valuable contribution towards the settlement of current problems. Through three sections a polemic is carried on; first with Spinoza and the Spinozists, next with Hegel and the Hegelians; and the importance attached to this portion of the essay by the writer himself may be gathered from the circumstance that the three sections under review occupy among them ninety-three pages—somewhat over the half of the whole.

In dealing with Spinoza, the first thing that the writer does is to enter his vigorous protest against regarding him as the legitimate successor of Descartes. "That he truly interpreted the main characteristic features of the philosophy of Descartes," he says, "or carried out its proper tendency, I emphatically deny." Elsewhere he maintains—"The logical successor of Descartes was certainly Leibnitz, not Spinoza." In handling his subject the course adopted is this:—He takes the Spinozistic method and compares it with the Cartesian, and finds as the result that the two are in diametrical opposition; instead of intuition and experience, we have a return to the scholastic abstraction and deduction. He next follows out the Spinozistic method into its applications, and shows, in considerable detail, the absurdities in which it lands. Broadly speaking, he claims to have established three things:—(1) That the Spinozistic method, misrepresenting as it does, and affecting to despise, the psychological, nevertheless leans upon the psychological for help, and is impotent without it; (2) that, when viewed in connexion with the full contents of consciousness, it involves itself in absolute contradiction; (3) that it is altogether powerless to deal successfully with either the physical or the metaphysical problem. These, there can be little question, are three weighty points, if thoroughly substantiated; and that they *are* thoroughly substantiated we certainly incline to believe. Our only objection is, that the writer has shown an excess of fire in the discussion, and permits himself the use of stronger condemnatory epithets than the circumstances warrant.

There is no abatement in the author's vigour when the polemic is pursued in Section xi. over the 'Omnis determinatio est negatio'; and the climax is reached in Section xii., when the discussion turns on "Hegelian Criticism—the Ego and the Infinite". This last section may be strongly commended to the attention of all who are interested in the Hegelian movement.

Perhaps we shall not do Professor Veitch an injustice if we represent his attitude towards Spinozism and Hegelianism somehow thus:—He regards them both as Sentiments rather than Philosophies (*Sentimentisms*—were we to coin a word), and as such unworthy of support. His objection to them is twofold. On the one hand, they are unphilosophical in character, being an abnegation of rationality; on the other hand, they are hurtful in practice, being opposed to the best and highest interests of mankind. They are vicious speculatively and

they are vicious ethically, and, instead of being a progress or a development, they are both retrograde movements—"relapses into the antiquated verbalistic thought"—in great measure "caricatures" of the truth. WILLIAM L. DAVIDSON.

The Religion of the Future. By JOHN BEATTIE CROZIER, M.B. London: Kegan Paul, 1880. Pp. 290.

Mr. Crozier's work consists of five separate essays, entitled respectively "Carlyle," "Emerson," "Herbert Spencer," "Considerations on the Constitution of the World," and "God or Force?" The two first-named papers, which occupy more than half the volume, lie for the most part outside the sphere of this journal. They consist of patient and generally eulogistic analyses of Carlyle's and Emerson's opinions upon all subjects, religious, political, and social. The other three may fairly be classed as philosophical in intent. The object of the whole work, Mr. Crozier tells us in his preface, is "to separate as far as possible the non-essential and transitory elements of Religion from the essential and perennial, and to give to these latter a consistent and enduring form, a form that will satisfy the feelings of the heart, while resting on the strictest inductions of science". Around this Religion of the Future, Mr. Crozier "hopes to unite religious thinkers of all classes in a common stand against Materialism and Atheism". The new creed appears mainly to consist in a shadowy idealistic Theism, almost as attenuated as that proclaimed by Mr. Matthew Arnold or Mr. Carlyle himself.

The essay on "Herbert Spencer" contains an examination and criticism of *First Principles*. After analysing that work, Mr. Crozier finds that Mr. Spencer identifies the Absolute Reality with the Persistence of Force, a statement which recurs so frequently that it cannot be due to mere oversight. It is, however, entirely misleading, as Mr. Spencer really identifies the Absolute Power underlying the universe, not with the Persistence of Force, but with the Force itself whose persistence he asserts to be tacitly assumed in all acts of reasoning. Mr. Crozier then goes on to argue, "firstly, that the Persistence of Force is *not* the basis of Science, and that the Law of Evolution is *not* a corollary from it; secondly, that it is *not* the Absolute Power of which the Universe is a manifestation, and that it is *not* the object of religious worship". He endeavours to show that Mr. Spencer's reasoning under the first head really proceeds, not upon the persistence of force, but upon a *fixed quantity* of force, or upon a fixed quantity of matter. This appears to be one of those numerous objections which have resulted from the fact that physical terminology was in a transitional state when *First Principles* originally appeared, and that the Conservation of Energy had not yet been accurately distinguished from the constancy of those Forces (such as gravitation) which are now more or less definitely distinguished from Energies by the later

school of physicists. The whole class of adverse criticisms thus aroused would probably have been avoided had Mr. Spencer employed a neutral term, such as 'Indestructibility of Power'. Under the second head, Mr. Crozier asserts that Mr. Spencer "having in one half of the book used the Persistence of Force as simply the *sum-total* of the forces of Nature, in the other half uses it as the *Cause* of these forces," and so illegitimately identifies it with the object of worship. Finally, the critic thus sums up Mr. Spencer's theory, when stripped of its supposed disguises:—"The Universe consists of a *fixed* quantity of matter, which has existed *from all eternity*, which is *indestructible*, and which, through the antagonistic forces that compose it, *itself necessitates* the changes passed through and still going on". This, he says, is "the old atheistic theory": it is "simply that of self-existent matter, and is open to Mr. Spencer's own criticism that it is impossible to think or conceive a self-existent Universe". But Mr. Crozier apparently forgets that Mr. Spencer finds Theism and Pantheism also equally unthinkable; and we should have thought it sufficiently obvious that of the three unthinkables Mr. Spencer's own turn of thought (if he had to choose among them) would lead rather to Pantheism than to Atheism.

Mr. Crozier then proceeds to state his counter-theory, which is a systematic and theistic Carlylism. He rejects the antinomies adduced to exemplify the limitations of human understanding (such as the impossibility of conceiving space as either finite or infinite), and decides in favour of universal finiteness, in which verdict he seems to include even his First Cause. "Matter and space being finite, there is no reason for supposing the First Cause to be Infinite. It is enough for us,—poor, wandering light-gleams cast upon this latest wave of time—to be permitted to behold, and for a moment to enjoy, this incomparable panorama of Nature, and, lifting our eyes above, to know it has a commensurate Cause, and humbly worship there." The universe is next explained by a Carlylian idealism as a sort of *idolon*, projected apparently by the human mind itself. "As the constitution of the senses makes the *material* world, and the constitution of the sentiments the *social* and *moral* world; so the constitution of the intellect makes the *Laws of Nature*." Accordingly, even the existence of the First Cause is warranted to us by "the intuition of Causation," while "the scale of Sensations demands that the *attributes* of this Cause shall be commensurate with the dignity of the human mind". "The materialists put the cart before the horse. The Laws of Nature do not create the mind of man, but the mind of man is created to perceive, among other things, the Laws of Nature". As to the mode of creation, Mr. Crozier is singularly silent. Some of his remarks concerning his First Cause, however, seem to point towards a very impersonal Deity, and remind one strongly of the 'stream of tendency which makes for righteousness'. "There is in Nature and the Human Mind," he says, "a *Public Element* which works for universal, and not particular, ends. . . . A glance over the animal and vegetable world reveals the existence of a Power which

works for the general good. This is seen in the proportion which is everywhere kept between animal and vegetable life, thus preserving the proper composition of the atmosphere. It is seen in the proportion kept among the different races of animals, by the balance between the powers of aggression and defence." But surely a little elementary Darwinism would show Mr. Crozier that the absence of such proportion is physically inconceivable: while it is a novel doctrine to enforce the dogma of Divine Beneficence by the claws of the tiger, the sting of the scorpion, and the admirably defensive poison of the upas tree. In spite of such shadowy language, Mr. Crozier's Deity often appears as apparently personal and creative. For example—"These intuitions and feelings are *fixed and unchanging*, are there by the will of God, and cannot be explained at all." On the other hand, there are some passages which seem to bespeak the most indefinite pantheism, such as the following: "And now we may see why the Cause of the Universe is moral. Because, although it is *consciously* present only in the mind of man, it appears everywhere in Nature in objects that have no Moral Sense. It is the *public element*, which we saw not only in the Moral Sentiment in man, but in the provision that is made to keep every leaf, every plant, every tree, and every animal in strict subordination to the welfare of the whole."

Altogether, Mr. Crozier's meaning is not so clear as might be wished. He is fond of that kind of mysticism which consists in producing the illusion of an explanation by the employment of vague but high-sounding language. His work seems hardly adapted to present needs. It might have secured attention during the earlier days of Carlyle's vaticination, but it fails to satisfy minds accustomed to the rigorous physical or logical conceptions of later thinkers.

GRANT ALLEN.

VIII.—NEW BOOKS.

[*These Notes are not meant to exclude, and sometimes are intentionally preliminary to, Critical Notices of the more important works later on.*]

The Brain as an Organ of Mind. By H. CHARLTON BASTIAN, M.A., M.D., F.R.S., Professor of Pathological Anatomy and of Clinical Medicine in University College, London. With 184 Illustrations. The International Scientific Series. London: Kegan Paul, 1880. Pp. 708.

Dr. Bastian has supplied the following statement of the scope of his work:—

"After pointing out the uses of Nervous Systems and the fundamental nature of that portion known as the Brain, the author briefly discusses the nature and mode of arrangement of Nerve-elements generally. He then proceeds, in a series of intermixed chapters, on the one hand to explain the leading types and variations in the brains of lower animals, and on the other to consider (by the light derived from well-authenticated instances of

the acts of lower animals) something of the nature and degree of complexity of their mental processes. It is shown, on the one side, how the brains of animals, and especially those of the Quadrumanous series, lead on to the structural conformations met with in the brain of Man, and on the other how the mental processes occurring in men have their rudimentary correlatives in the mental processes of animals. The anatomy of the human brain is more fully considered, and the tracks for ingoing and for outgoing impressions in their passage through the organ are indicated as fully as our present knowledge will admit. Modern doctrines of localisation are discussed and reasons are advanced for a disbelief in the existence of 'Motor Centres' in the cerebral cortex. The author also sums up the evidence for and against 'Muscular Sense' impressions being concomitants of outgoing currents. In dealing with the human brain as an organ of Mind, he has striven to explain the nature of the evidence concerning the localisation of Thought-processes derivable from the study of diseases during life and morbid brain-changes after death, and has shown what light may be thrown upon this part of his subject by the investigation of cases in which Thought and Speech have been variously interfered with. The author discusses the scope of 'Mind' from the modern scientific standpoint, and has endeavoured to show, within the limits of a volume addressed to the general public, to what extent the Science of Mind reposes upon Subjective Psychology, Objective Psychology and Neurology respectively."

An Introduction to the Philosophy of Religion. By JOHN CAIRD, D.D., Principal and Vice-Chancellor of the University of Glasgow. Glasgow: Maclehose, 1880. Pp. 358.

Critical notice of this work is unavoidably deferred. The substance of it was delivered in Edinburgh as the Croall Lecture for 1878-9. The author, however, has not deemed it necessary to retain the form of lectures, finding that it gives rise to arbitrary divisions and interruptions of the continuity of thought. After Preliminary Remarks on the function of Philosophy, he first considers the Objections to the Scientific treatment of Religion (*a*) from the relative character of Human Knowledge, (*b*) from the immediate or intuitive character of Religious Knowledge, and (*c*) from its authoritative character; and then in succession treats of the Necessity of Religion, the Proofs of the Existence of God, the Religious Consciousness, Inadequacy of Religious Knowledge in the Unscientific Form, Transition to Speculative Idea of Religion, the Religious Life (Relation of Morality and Religion), Relation of the Philosophy to the History of Religion.

The Moral Philosophy of Aristotle: consisting of a Translation of the *Nicomachean Ethics* and of the *Paraphrase* attributed to Andronicus of Rhodes, with an Introductory Analysis of each Book. By the late WALTER M. HATCH, M.A., Fellow of New College, Oxford, &c. Completed after his death by Others. London: Murray, 1879. Pp. 589.

The translator, already known as editor of the first volume of Shaftesbury's *Characteristics* (1870), died suddenly in 1877, at the age of 33, leaving the present work unfinished beyond Books i.—vi. It has been completed by some of his friends, who thought well of the

scheme and of its execution and considered the book likely to be useful especially to students at the Universities.

"Its aim is to make the *Nicomachean Ethics* of Aristotle intelligible to a modern reader. It endeavours to do so chiefly by modifying the style in which the original is written. . . . Missing links of thought have been inserted; hints which were contained in brief condensed phrases have been expanded; that which was in some cases an unapparent inference beneath the surface has been brought into the light. . . . . But no additions have been made to Aristotle's statements and no inferences have been inserted which his words do not immediately imply. Three other kinds of help are offered to the student: (1) Every Book is preceded by an analysis of its contents . . . . in the form in which they might be stated by a modern writer. (2) The chapters and sections into which the Greek text has been divided, have been disregarded, and new divisions and subdivisions have been made . . . . (3) To each section of the text of Aristotle has been added a translation of the best known of existing Greek paraphrases . . . . in lieu of a commentary."

Outlines of the Philosophy of Aristotle. Compiled by EDWIN WALLACE, M.A., Fellow and Tutor of Worcester College, Oxford. Second and considerably enlarged Edition. Oxford and London: Parker, 1880. Pp. 70.

This is an expansion of a smaller work published with the same title in 1875, mainly for use by the author's pupils. As Zeller's volume on Aristotelianism is being translated into English, he has not thought it well to expand in the sense of "writing out". The form of "Outlines" is still retained, by giving with the more important passages in Aristotle's writings (in the original Greek) only a brief English analysis, for explanation and in place of context. After a short Introduction, biographical and bibliographical, the analyses and extracts are presented under the following heads in order: Logic, Metaphysic, Philosophy of Nature, Psychology, Moral and Political Philosophy, Philosophy of Art; with Index at the end. Within small compass, the work is very thoroughly done. Naturally, the physical and physiological treatises are least drawn upon (being disposed of in some six pages): their varied contents do not admit of short presentation and are now less important in themselves. But, as the author urges—

"We are still anxious to know whether our perception of a real world comes to us by an exercise of thought or by a simple impression of sense—whether it is the universal that gives the individual reality or the individual that shapes itself, by some process not explained, into an universal—whether bodily movements are the causal antecedents of mental functions or mind rather the reality which gives truth to body—whether the highest life is a life of thought or a life of action—whether intellectual also involves moral progress—whether the state is a mere combination for the preservation of goods and property or a moral organism developing the idea of right. And about these and such like questions Aristotle [in his moral and metaphysical works] has still much to tell us."

The Manual of Budhism, in its Modern Development. Translated from Singhalese MSS. By R. Spence Hardy, Author of *Eastern Monachism*, &c. Second Edition. London: Williams & Norgate, 1880. Pp. 566.

"The present volume having been out of print for some time, the demand for it, however, still being so great that copies have been sold in public sales for several pounds, the publishers have been induced to reprint a small edition of the work. They have taken the opportunity of correcting a few errors and adding a much more complete Index, which has been kindly compiled by Dr. Frankfurter of Berlin, who is pursuing Pali studies in London. In every other respect the present is an exact reproduction of the first edition."

Degeneration. A Chapter in Darwinism. By Prof. E. Ray Lankester, F.R.S. *Nature* Series. London: Macmillan, 1880. Pp. 75.

The author argues (after Dr. A. Dohrn of Naples) that Degeneration, as well as Balance or Elaboration, may follow from the play of Natural Selection. The hypothesis of Degeneration, when applied generally, instead of being applied as by naturalists hitherto only to the case of parasites, will, he believes, "be found to render most valuable service in pointing out the true relationships of animals which are a puzzle and a mystery when we use only and exclusively the hypothesis of Balance or the hypothesis of Elaboration." Degeneration may be brought on by parasitism, or immobility, or vegetative nutrition, or extreme reduction of size. After illustrating his thesis from various cases of the lower animals, especially the ascidians, the author at the end touches briefly on Degeneration in man, as shown in barbarous races and possibly also in modern Europeans:

"As compared with the immediate forefathers of our civilisation—the ancient Greeks—we do not appear to have improved so far as our bodily structure is concerned, nor assuredly so far as some of our mental capacities are concerned. Our powers of perceiving and expressing beauty of form have certainly not increased since the days of the Parthenon and Aphrodite of Melos. In matters of the reason, in the development of intellect we may seriously inquire how the case stands. Does the reason of the average man of civilised Europe stand out clearly as an evidence of progress when compared with that of the man of bygone ages? Are all the inventions and figments of human superstition and folly, the self-inflicted torturing of mind, the reiterated substitution of wrong for right, and of falsehood for truth, which disfigure our modern civilisation—are these evidences of progress? In such respects we have at least reason to fear that we may be degenerate. Possibly we are all drifting, tending to the condition of intellectual barnacles or ascidians."

In these remarks, the author is somewhat too indiscriminate. If we have degenerated from Greek days, it is hardly in "intellect," or in morality either. The interesting question, from the point of view of Evolution, is whether the intellectual and moral progress could not have been attained except at the expense of the ancient joy in life and power of artistic creation. In the conditions of human nature, perhaps it was not possible.

Elementary Notions of Logic. Being the Logic of the First Figure, designed as Prolegomena to the Study of Geometry. By Alfred Milnes, M.A. (Lond.) London: Swan Sonnenschein & Allen, 1880. Pp. 112.

This little book "purports to be not so much a contribution to logical science itself as to the art of teaching it". The author thinks "that a small area of the subject should be first mapped out and treated as completely as possible, then the boundaries of this area enlarged, and the new area as completely treated again". For the first area he has chosen so much of Logic as seems to him to be necessary to a just appreciation of the First Book of Euclid. The treatment is not without freshness when the author is dealing with special modes of demonstration like the Argument *a fortiori*, *Reductio ad absurdum*, &c., as presented in geometrical science. The account of Contraposition and related processes might be improved in itself, and might have received the kind of application that has been introduced into some recent manuals of elementary geometry. With his special object in view, it is a little surprising that the author should have neglected this opening.

Some Thoughts concerning Education. By John Locke. With Introduction and Notes by the Rev. R. H. Quick, M.A. Trin. Coll. Camb. 'Pitt Press Series'. Cambridge: University Press, 1880. Pp. 240.

Some Thoughts concerning Education. By John Locke. With Introduction and Notes by the Rev. Evan Daniel, M.A., Principal of the National Society's Training College, Battersea. London: Nat. Society's Depository, 1880. Pp. 364.

These two editions of Locke's classical *Thoughts* were independently projected to meet the present demand among teachers for guidance in their work, and more especially with reference to the requirements of the Teachers' Examination newly instituted by the University of Cambridge. Both Editors have done their work very carefully. Canon Daniel relies to some extent on earlier commentators, but is also able to illustrate his subject from the works of the latest authorities on educational theory and practice. Mr. Quick, as was to be expected from one who is himself an authority in the history of Education, throws valuable light on Locke's relation to his predecessors in the field of educational theory, especially Montaigne. A particularly interesting feature of the Cambridge edition are the notes on medical points contributed by Dr. J. F. Payne, who brings to the interpretation of Locke's professional injunctions a rare acquaintance with the history of Medicine, as well as to the criticism of them the knowledge of a trained physiologist.

Evolution and Involution. By George Thomson. London: Trübner, 1880. Pp. vii. 205.

This is a somewhat mystical work, directed against Mr. Darwin and Mr. Herbert Spencer, in the interests of an indefinite sort of

Christianity. It consists chiefly in an exposition of what the author calls the Law of Evolution and Involution, which he formulates as follows :—

"The Law of Evolution and Involution is that *all beings in proportion as they assume personality and* EVOLVE *out of the universe, in that proportion do they* INVOLVE *it within themselves and incorporate it, approaching at the same time absolutism in all its attributes.*"

So far as we can judge, the law amounts merely to the statement that every being can only understand as much of the universe as it understands, and that the higher animals understand more of it than the lower. "Evolution, as explained by Mr. Darwin and his followers and associates," Mr. Thomson expressly rejects. His standpoint is apparently that of a christian pantheist, who disbelieves in the hypothesis of development and accepts that of direct creation in a mystical form, as presentation or self-realisation of the Deity. The following extracts will best express his position :—

"This eternal and indestructible thing which is to us the universe, is not to the pebble, is sentiently to the flower, is materially to the lower animal, is ideally to the man, and *is* to an Absolute Being. . . . If the race of men, however, were extinct or annihilated, there would be no universe as it is to man ; yet it would be, and that eternally. In other words, it is as much of God as we can see ; for it is the face of God tinged, and limited by, idea, which is of man. It is the mode in which we see God ; but if we were absolute and complete personalities, we would be as God, and would not be God, and yet would be God ; and the universe, in its actuality and potentiality, in accordance with the principles of the Law of Evolution and Involution, would be ourselves, and we would be the universe." [G. A.]

The Spirit of Nature. By Henry Bellyse Baildon, B.A., Cantab. Member of the Pharmaceutical Society, Author of "Morning Clouds," "Rosamund, a Tragic Drama," &c. London: Churchill, 1880. Pp. xv., 216.

Mr. Baildon reproduces in this volume a series of Lectures delivered before the Pharmaceutical Society in Edinburgh. He attacks the Darwinian theory of Natural Selection, while admitting the "possibility" of Evolution in some form. Beginning with chemistry, he endeavours to show that the chemical molecule itself bears marks of "intelligent creation". Passing on to botany, he argues that physical and chemical laws are insufficient for the production of vital phenomena. Evolution must have been guided and directed by a superior Intelligence. The botanical argument forms by far the larger portion of the volume, but displays rather a poetical than a scientific spirit. The last chapter deals with the alleged cruelty of nature, which Mr. Baildon combats partly on the ground that pain is necessary, and partly on the ground that most of the lower animals either feel very little or are anæsthetised by excitement during struggles or narcotised by special provisions of nature. [G. A.]

Zur Theorie der Wechselwirkung zwischen Leib und Seele. Von C. S. Cornelius. Halle: Nebert, 1880. Pp. 90.

This is a series of short discussions of problems in the physiology of vision, hearing, attention, &c., with a view to show the congruity of the phenomena with a Herbartian conception of matter and mind and their relation one to another. A number of interesting points are touched on, including the physiological conditions of the sensations of white, black, &c., the perplexing phenomena of optical contrast, the functions of the different nervous appendages of the ear in relation to the perception of tone, noise, &c., Fechner's psychophysical law, the relation of attention to sensation, and the causes of sleep and dreams. The author presents the newest facts under each head, and subjects the theories of different physiologists, including Helmholtz, Fechner, Hering, and Exner, to a thoughtful criticism. The relation of the Herbartian principles with which he sets out to the phenomena investigated is not always very manifest. Indeed it may be said that the chief value of this little work is quite independent of that of its metaphysical basis, and consists in the clear though brief account of a number of those interesting researches in physiological psychology with which the German physiologists are now busying themselves, as well as a consideration of the various modes of interpreting the facts suggested by these investigators. [J. S.]

Studien über die Sprachvorstellungen. Von Dr. S. Stricker, Universitäts-Professor in Wien. Mit 3 Holzschnitten. Wien: Braumüller, 1880. Pp. 106.

Prof. Stricker has been moved, through doubts lately cast by Prof. Delboeuf on the theory of illusions (as involving the function of peripheral nerves) set up in his *Studien über das Bewusstsein* (Mind XIV., 293), to investigate more particularly the nature of our mental representation of Words. The investigation is conducted with all his characteristic care and candour, and ends in the result that verbal representation is essentially a representation of muscular acts determined from within outwards. Prof. Bain, to whom Dr. Stricker refers at second hand, took up this position long ago, but nobody before Dr. Stricker has so carefully distinguished between laryngeal movements and those acts of articulation proper which are the really important ones in actual or represented speech. On another occasion we may draw more particular attention to Dr. Stricker's results. Let it suffice meanwhile to say that his little treatise should be overlooked by no psychologist concerned either in the special question of Speech or in the general question of the "Muscular Sense".

Spinoza: his Life and Philosophy. By Frederick Pollock. With Portrait. London: Kegan Paul. 1880. Pp. xli. and 467.

"The appearance of this book, which in other respects is ready for publication, is *postponed* to the autumn season by unavoidable delay in the execution of the frontispiece, which is to be a reproduction of the engraved

ortrait of Spinoza found in many copies of the *Opera Posthuma*, but rare this country. It is preceded by a biographical introduction, giving particulars of some early notices of Spinoza, especially in England, not mentioned Van der Linde's bibliography of the subject, and of recent translations nd other works. The general object is to put before English readers an ccount, fairly complete in itself and on a fairly adequate scale, of the life nd philosophy of Spinoza. The book aims, in the first instance, at being nderstood by those who have not made a special study of the subject; ut it may also not be useless to some who already know Spinoza at rst hand, and even to critical students of philosophy. The two first napters are given to Spinoza's life and miscellaneous letters, and the last ne to a sketch of the reception and influence of his work down to the pre-nt time. The rest of the book explains and discusses his philosophy. ome special attention is paid to the comparison, from the point of view of ne English school of jurisprudence, of Spinoza's political theory with that f Hobbes. A certain number of important passages from the *Ethics*, inuding the whole of the appendices to Parts III. and IV., are translated. he old English version of the Life of Colerus is reprinted as an appendix, nd the Latin text of an original letter of Spinoza's in Victor Cousin's library printed for the first time."

IX.—MISCELLANEOUS.

THE FOLLOWING is an abstract of the Inaugural Lecture delivered by Professor J. B. Mayor at King's College, London, on April 28. Taking s his subject the question 'What is the good of Moral Philosophy?' Prof. Mayor summed up the popular objections to this study under hree heads; (1) It tells us nothing new, but merely formulates ruisms; (2) It busies itself with speculative questions, and is of no se for practice; (3) All other moral teaching is superseded by Revetion. After expressing a qualified assent to objection (2), as far s it referred to the actual procedure of modern writers on ethics, he vent on to examine objection (3), and asked what was to be one with those who did not accept Revelation; were they to be eclared incapable of morality? He pointed out that to base morality n religion was to invert the logical order, since our moral instincts ormed the main foundation of our belief in a God as in a revelation rofessing to be divine; that the Bible itself presupposed a knowledge f right and wrong; that in many points the moral teaching conained in the Bible was either transitional (*e.g.*, the prohibition of usury, nd of things strangled), or incomplete (as in reference to slavery); hat in any case Moral Philosophy was needed in order to systemaise, to develop and to apply the teaching contained in Scripture. Turning to objection (1), he remarked that it assumed the existence f one recognised rule of life and theory of conduct, but if we looked ot to words but to actions, we should see that there was no such niform theory of conduct: the ideals of happiness, duty and virtue, aried for different races, periods, classes and ages. It was the office f 'descriptive ethics' to bring into clear light the views half-consciously held by those who were not philosophers. Some of these iews had been systematised and become recognised ethical theories,

as the cavalier's or soldier's view in the code of honour, the lawyer's view in jurisprudence or the theory of right. The study of descriptive ethics was not merely of interest in itself, it was practically useful as supplying data for our own guidance. To know what, as a fact, men have believed and acted on under varied conditions of life during the past ages of the world, will help to determine the rule of conduct for the small fraction of humanity which happens to occupy the earth at this moment. Passing to practical ethics, we find modern life governed partly by old traditions, partly by novel theories propounded as so many new gospels by their several schools. It is the office of Moral Philosophy to bring them all before the bar of reason, to strip them alike of venerable associations or pretentious assumption, and exhibit the underlying principles in their naked reality. Whatever the question raised may be, when it once takes the form 'Ought I to do this thing or ought I not?' the ultimate decision rests with ethics. Particular sciences, such as medicine or political economy or theology, may be called in to give their evidence as to the facts involved in any case; but the ethical end, which is the perfection of humanity, necessarily overrides every subordinate end. Besides its descriptive and judicial functions Moral Philosophy has a no less important work of discovery, to advance the lines of ethical thought, to devise new means for promoting the upward progress of humanity. This branch of the subject was illustrated by a reference to various ethical desiderata, *e.g.*, the determination of the relation between absolute and relative ethics, between ethics and politics, between ethics and political economy, the establishment of a scientific theory of education, &c.

A SCHEME proposed by the Board of Moral Sciences Studies for modifying the regulations of the Moral Sciences Tripos has recently been confirmed by the Senate of the University of Cambridge. According to the old regulations, candidates were examined in the four following subjects—Moral and Political Philosophy, Psychology and Metaphysics, Logic, Political Economy; and practically it was necessary to take up all four subjects in order to obtain a first class. The object of the change now instituted is to permit and encourage a certain degree of specialisation in the students' reading; and it is anticipated that incidentally the Tripos will be made more attractive to students who have already taken honours in another subject, *e.g.*, to those who have taken Classical Honours, and who have in connexion with that Tripos already devoted considerable attention to the problems of Ancient Philosophy. Under the new regulations, the examination will consist of two parts. In the first part, the subjects are Psychology, Logic, Metaphysics, Moral and Political Philosophy, and Political Economy; and in addition to papers on these subjects there will be one paper set containing questions in General Philosophy. Candidates will not, however, be examined in more than five out of these six papers. In this part it is intended that the questions set shall be of a more elementary, or at

east of a more general character; whilst in the second part more dvanced or more detailed knowledge will be required. In this second art there are to be six subjects of examination, three historical, *viz.*, History of Ancient Philosophy, History of Modern Philosophy, and History of Modern Political Philosophy and Economic Theory; and hree theoretical, *viz.*, Advanced Psychology, Advanced Logic, and Advanced Political Economy. But candidates must confine their ttention to *two* out of these six subjects. In this way it is hoped hat sufficiently free play will be allowed to individual tastes and aculties without sacrificing the distinctive character of the Moral Sciences Course, or impairing the thoroughness of the work of the tudents. It may be added that now that alternative papers are llowed to be taken, it is decided to abolish the system of placing andidates in order of merit in their respective classes. Marks of listinction will, however, be affixed to the names of those who have hown eminent proficiency in particular subjects.

It is announced by the Spinoza Committee at the Hague that the tatue of Spinoza will probably be completed and in its place in the nonth of August. The unveiling will take place on or about the 1st f September, and foreign subscribers and members of local sub-ommittees are invited to attend.

Professor Bain has retired from the Chair of Logic in the University f Aberdeen, being advised, after twenty years of service, to seek elease from the strain of teaching.

The Journal of Speculative Philosophy.—Vol. XIV. No. 2. Schelling on Natural Science' (tr.). 'Kant's Anthropology' (tr.). 'Hermann Grimm on Raphael and Michael Angelo' (tr.). 'Rosenkranz on the Science of Education' (paraph.). J. Albee—'Ars Poetica et Humana'. J. H. Gulliver—'The Psychology of Dreams'. T. Gray—'Laws of Creation—Ultimate Science'. W. T. Harris—'Educational Psychology (Outlines)'. Notes and Discussions. Book Notices.

Revue Philosophique.—Vme Anée, No. 4. A. Fouillée—'Vues ynthetiques sur la sociologie'. B. Perez—'Le developpement du sens noral chez le petit enfant'. J. Delboeuf—'Le sommeil et les rêves' (iv.). Notes et Documents (Ch. Richet—'De l'influence des mouvements sur les ensations'. J. Boussinesq—'Sur l'impossibilité d'arriver aux notions géométriques par une simple condensation des résultats de l'expérience'.) Analyses et Comptes-rendus (W. K. Clifford, *Lectures and Essays*, &c.) Rev. des Period. No. 5. H. Lotze—'L'infini actuel est-il contradictoire? Réponse à M. Renouvier'. J. Sully—'Les formes visuelles et le plaisir sthétique' (tr. from Mind XVIII). Th. Ribot—'La mémoire comme fait iologique'. Notes et Docs. (V. Brochard—'Descartes stoicien'). Analyses, &c. Notices bibliographiques (R. Adamson, *On the Philosophy of Kant*, &c.) Rev. des Period. No. 6. F. et R.—'Considérations sur la philosophie chimique'. J. Delboeuf—'Le sommeil et les rêves' (fin). D. Nolen—'La critique de Kant et la religion'. Notes et Discussions (Ch. Renouvier—'Réponse à M. H. Lotze'). Analyses, &c. Notices bibl. Clifford, L. Lindsay, Harper, Balfour, Cyples, &c.). Rev. des Period.

La Critique Philosophique.—IXme Année, Nos. 6-18. J. Milsand—Une causerie: comment se forment les convictions qui influent sur la vie'

(6); 'Les sentiments et les idées' (7, 9); 'Le physique et le moral' (13, 14); 'La psychologie et la physiologie' (18). C. Renouvier—'Les labyrinthes de la metaphysique: Le libre arbitre selon les épicuriens et le commentaire de M. Guyau' (8); 'Le fétichisme, sa définition, sa place dans l'histoire des religions' (9); 'De la source psychologique du fétichisme, de la sorcellerie, de la magie et de l'astrologie' (10, 14). F. Pillon—'L'enseignement de la philosophie dans les lycées' (10); 'Une étude récente sur Locke et sa philosophie: H. Marion, *J. Locke, sa vie, &c.*' (11).

La Filosofia delle Scuole Italiane.—Vol. XXI. Disp. 1. F. Bonatelli—'Del Sogno'. T. Mamiani—'Della filosofia francese contemporanea'. F. Ramorino—'Di alcune argomentazioni contenute nel Protagora di Platone'. Bibliografia, &c. Disp. 2. T. Mamiani—'Sulla psicologia e la critica della conoscenza, prima lettera al prof. Sebastiano Turbiglio'; F. Tocco—'L'analitica transcendentale e i suoi recenti espositori'. M. Panizza—'Antropologia: La fisiologia del sistema nervoso nelle sue relazioni coi fatti psichici'. Bibliografia, &c.

Zeitschrift für Philosophie, &c. Bd. LXXVI. Heft 2. W. Wiegand—'Leibniz als Religions-Friedenstifter' (ii.). E. Rehnisch—'Zur Kritik herkömmlicher Dogmen u. Anschauungsweisen der Logik, insbesondere des Lehrstücks vom Schluss' (Forts.). Recensionen. Bibliographie.

Zeitschrift für Völkerpsychologie u. Sprachwissenschaft. Bd. XII., Heft 1. F. Misteli—'Lautgesetz u. Analogie: Methodisch-psychologische Abhandlung' (Schlnss). O. Flügel—'Ueber die Entwickelung der sittlichen Ideen'. Beurtheilungen.

Vierteljahrsschrift für wissenschaftliche Philosophie. Bd. IV., Heft 2. C. Semper—'Ueber die Anwendbarkeit der monophyletischen u. polyphyletischen Abstammungs-hypothese'. E. Laas—'Die Causalität des Ich' (ii.). J. Bergmann—'Idealistische Differenzen, &c.: Eine Entgegnung'. Recensionen. Selbstanzeigen.

Books, &c., received besides those noticed above:—J. C. Bucknill, *The Care of the Insane*, London (Macmillan), pp. 133; G. Curtius, *The Greek Verb*, Trans. by A. S. Wilkins and E. B. England, London (Murray), pp. 585; R. Ward, *The Constitution of the Earth*, London (G. Bell), pp. 383; W. A. Hunter, *Introduction to Roman Law*, London (Maxwell), pp. 209; *Social Rights*, Glasgow (Aird and Coghill), pp. 208; G. Mallery, *Introduction to the Study of Sign Language among the North American Indians*, Washington (Govt. Printing Office), pp. 72; H. Marion, *Franciscus Glissonius quid de Natura Substantiae seu Vita Naturae senserit*, Lut. Par. (Baillière), pp. 136; H. Marion, *De la Solidarité Morale*, Paris (Baillière), pp. 336; C. A. Du Péan, *Recherches sur la Nature de l'Homme*, Paris (Ghio), pp. 89; G. Barzelloti, *La nuova Scuola del Kant*, Roma (Barbèra), pp. 40; B. Giovanni, *L'Educazione &c., secondo il Metodo naturale*, Torino (Vincignerra), pp. 227; P. Siciliani, *La Scienza dell' Educazione &c.*, Bologna (Zanichelli), pp. 204; W. Wundt, *Der Aberglaube in der Wissenschaft*, Leipzig (Brockhaus), pp. 24; A. Anderssohn, *Die Theorie vom Massendruck aus der Ferne*, Breslau (Trewendt), pp. 71; A. Bilharz, P. Dannegger, *Metaphysische Anfangsgründe der math. Wissenschaften*, Sigmaringen (Tappen), pp. 97; H. Höffding, *Die Grundlage der humanen Ethik*, aus dem Dänischen, Bonn (Strauss), pp. 107; A. Marty, *Ueber den Ursprung der Sprache*, Würzburg (Stuber), 1876, pp. 150; H. Kronecker, G. Stanley Hall, *Die willkürliche Muskelaction*, Leipzig (Metzger), 1879, pp. 37; G. S. Hall, J. v. Kries, *Ueber die Abhängigkeit der Reactionszeiten vom Ort des Reizes*, Leipzig (Veit), 1879, pp. 10.

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MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—ÆSTHETIC EVOLUTION IN MAN.

All the higher processes of evolution are necessarily so complex in character that we can really deal with only a single aspect at a time. Hence, in spite of the rather general title which this paper bears, it proposes to treat of æsthetic evolution in man under one such aspect only—that of its gradual decentralisation, its increase in disinterestedness from the simple and narrow feelings of the savage or the child to the full and expansive æsthetic catholicity of the cultivated adult. We have to trace the progress of the sense of beauty from its first starting-point in the primitive sensibilities of the race or the individual to its highest development in the most refined and advanced of European artists.

To do so, we must first find this starting-point itself. What is the centre from which the widening circle of æsthetic sensibility takes its departure? In other words, what is the primitive source of the appreciation of beauty? Putting the question into a concrete form, what objects did man, as a whole, and does each man in particular, first find beautiful? If we look at a cultivated European, we see that he derives great æsthetic enjoyment from contemplating the sunset clouds, the green trees, the lakes, rivers, and waterfalls, the flowers, birds, and insects around him. But if we look at a savage or a child, we see that for the most part they care for none of these things. We might almost conclude, on a hurried glance, that they had

no sense of beauty whatsoever. Yet, when we examine them a little more closely, we find that there are many objects to which they do apply some such word as *pretty*, the symbol of the simplest æsthetic appreciation. If we can discover the limitations of these earliest æsthetic objects, we shall have solved one of the most important fundamental problems in the theory of beauty.

The settlement of such fundamental problems seems to me an indispensable preliminary to the construction of a scientific doctrine of æsthetics. When professors of fine art discuss the principles of beauty, they are too fond of confining themselves to the very highest feelings of the most cultivated classes in the most civilised nations. The mere childish love of colours, the mere savage taste for bone necklets and carved calabashes, seem beneath their exalted notice. Nay, more, we constantly find them accusing one another of having no feeling for beauty, or at least very little. Thus we see Mr. Ruskin and Mr. Poynter each mutually denying the other's powers of appreciation. But the psychological æsthetician cannot confine his attention to such exceptional and highest developments of the love for beauty as engage the whole interest of these artistic critics. He must look rather to those simpler and more universal feelings which are common to all the race, and which form the groundwork for every higher mode of æsthetic sensibility. It is enough for him that all village children call a daisy or a primrose pretty: he need not go far afield to discuss the peculiar specific merits of a Botticelli or a Pinturiccio. Hundreds of thousands, who would stare in blank unconcern at a torso from the chisel of Pheidias, can love and admire "the meanest flower that blows," with something not wholly unlike the welling emotions of a Wordsworth. Indeed, one is often inclined to fancy that the truest lovers of beauty in nature, or in the works of man, are not always those who can talk most glibly the technical dialect of art-criticism.

If we wish to hit upon the primitive germ of æsthetic sensibility in man, we cannot begin better than by looking at its foreshadowing in the lower animals. There are two modes of æsthetic feeling which seem to exist amongst vertebrates and insects at least: the first is the sense of *visual beauty* in form, colour, or brilliancy; the second is the sense of *auditory beauty* in musical or rhythmical sound. The former of the two modes I have endeavoured in part to illustrate in my little work *The Colour-Sense:* the latter has been admirably treated by Mr. Sully in his valuable essay on "Animal Music," which appeared in the *Cornhill Magazine* for November, 1879. Now if we look at the manner in which insects, birds, and mammals apparently

manifest these presumed æsthetic feelings, we shall see that they are very restricted and limited in range. Animals never seem to admire scenery, or foliage, or beautiful creatures of other species. They do not appear for the most part to care greatly for human music, or for any sounds other than those uttered by their own kind. They do not even show any marked æsthetic enjoyment of the lovely flowers and fruits whose tints, as Mr. Darwin teaches us, are mainly due to their own selective action. But, if our great biologist is correct in his reasonings,[1] they *do* very distinctly display their admiration for the beautiful forms, colours, and songs of their own highly decorated or musical mates. The facts on which Mr. Darwin bases his theory of sexual selection thus become of the first importance for the æsthetic philosopher, because they are really the only solid evidence for the existence of a love for beauty in the infra-human world. Granting the truth of his views (on which I for one have no shadow of doubt now remaining), we have good proof of a taste for symmetry and curved form in the magnificent tail of the lyre-bird, in the wedding plumage of the whydah-bird, in the twisted horns of the kudu antelope; of a taste for colour and lustre in the gorgeous train of the peacock, in the metallic necklets of the humming-bird, in the exquisite wings of tropical butterflies, in the bronze and gilded armour of the rose-chafers; lastly, of a taste for musical sound in the stridulation of the cicada and the house-cricket, in the deep notes of the bell-bird and the howler monkey, in the outpoured song of the linnet, the sky-lark, and the nightingale.

This close restriction of the æsthetic feeling to those objects which most nearly concern the individual, and through him the species, is only what we should naturally expect amongst the lower animals. We could hardly fancy them interesting themselves in anything so remote from their own personal wants as the rainbow or the sunset, the blue hills and the belted sea.

[1] I should like to add parenthetically that since the appearance of my work *The Colour-Sense*, and the numerous criticisms to which it gave rise, I have fully reconsidered the whole question of sexual selection in the light of all that has been written about it, and feel only the more convinced of the general truth of Mr. Darwin's views upon the subject. It may be naturally objected that I am not an impartial witness in this matter: but I should like further to state that, on examining the various authorities, *pro* and *con*, I find in every case that the persons who are uncommitted to any special theological, quasi-theological or metaphysical theory of evolution agree in full with Mr. Darwin, while only those differ from him who are bound down, *en parti pris*, to some more or less supernatural view of evolution, like Mr. Wallace, Professor Mivart, and Mr. J. J. Murphy, and who are therefore averse to any naturalistic explanation of the sense of beauty. I hope hereafter and elsewhere to enter more fully into this important question.

They and their ancestors before them could not have gained any advantage by turning aside their attention from the practical pursuit of food or mates, to the otiose contemplation of that which profiteth nothing. Our own disinterested love for things so distant from our substantial needs, has arisen gradually through a long process of ever widening sympathies and ever multiplying associations. But two things the insect, the bird, or the mammal could notice, and gain an advantage for itself or its race by noticing. It could pick out by its eye the forms and colours of edible foodstuffs among the unedible and relatively useless mass of foliage upon earth—the red berry or blossom from the green leaves, the fat white grub from the brown soil, the lurking caterpillar from the stalk whose lines and hues it so exactly imitates. It could distinguish by its ear the chirp of the savoury grasshopper from the click of the hard or bitter beetle, the pretty note of the harmless sparrow from the deep cry of the dangerous hawk or the greedy jay. Thus eye and ear alike became educated amongst the superior articulates and vertebrates, in anticipation, as it were, of their higher æsthetic functions.

In the choice of mates, however, the powers so gained were exercised in a way which we cannot consider as falling short of the true æsthetic level. Even the lowest animals (amongst those in which the sexes are different) seem instinctively to distinguish their fellows from all other species. In the higher classes, where the eye and ear have been so educated as to discriminate minutely between various forms, colours, shades, and notes, the instinct must almost certainly operate through the senses of sight and hearing. Even amongst those races of insects, birds, and mammals in which no distinct marks of sexual selection exist, I believe the sight of beautiful members of their own kind must necessarily excite pleasurable feelings worthy of being ranked in the æsthetic class. In other words, I believe every crow must think its own mate *beautiful*. Not merely inferentially pleasant, but in the truest sense beautiful. There must be, it seems to me, such an intimate correspondence between the needs and the tastes of each species, that the sight and voice of a healthy, normal, well-formed mate must have become intrinsically pleasing for its own sake, as well as indirectly for its associations. The nervous centres of each species must, I conceive, be so constructed hereditarily as to answer congenitally to certain typical shapes and sounds often experienced ancestrally, and always with ultimate benefit to the race. Though the emotions require experience of the object to arouse them, when the object occurs the emotions naturally arise. Just as man has special cerebral structures—existing,

though dormant, even in deaf-mutes—for the perception and production of human language, so, I cannot but believe, every species of higher animal has special cerebral structures, with special corresponding blank forms of perception, for the intellectual recognition and appropriate emotional reception of its fellows and its mates. These feelings are innate in the sense that they occur spontaneously at sight of the proper objects. When Miranda falls in love at first sight with Ferdinand, the only young man she has ever seen, it seems to me that the poet has truly depicted a genuine psychological fact. At any rate, it is indubitable that, so far as man is concerned, the human voice has certain points of emotional and technical superiority over every other kind of musical instrument, and that the beauty of woman and of the human form is now and must always remain the central standard of beauty for all humanity.

The heart and core of such a fixed hereditary taste for each species must consist in the appreciation of the pure and healthy typical specific form. The ugly for every kind, in its own eyes, must always be (in the main) the deformed, the aberrant, the weakly, the unnatural, the impotent. The beautiful for every kind must similarly be (in the main) the healthy, the normal, the strong, the perfect, and the parentally sound.[1] Were it ever otherwise—did any race or kind ever habitually prefer the morbid to the sound, that race or kind must be on the high-road to extinction. The more every individual shares the healthiest tastes of its kind, and puts them in practice in the choice of a mate, the more is he or she ensuring for descendants a healthy and a successful life whereby it hands on its own sound taste to future generations. But, besides this fundamental typical beauty—the beauty which consists in full realisation of the normal specific form—there is another source of personal beauty on which sexual selection may act, and through which it has produced the greater number of its most striking effects. This source may be found in the exercise of tastes otherwise acquired upon relatively unimportant details of form, colour, or musical abilities. The taste for bright hues, acquired through the search for food in blossoms, berries, or brilliant insects, may be transferred to the search for mates, so that those mates will be most preferred which happen to vary most from the original typical colouration in the direction of more brilliant hues. The taste for musical sound, implied, as I have elsewhere

[1] This doctrine has been admirably illustrated by Mr. Herbert Spencer so far as regards the human species, in his essay on "Personal Beauty," which, though published long before the appearance of the *Descent of Man*, really contains the germ of the doctrine of sexual selection.

tried to show on the lines laid down by Helmholtz, in the very structure of the auditory apparatus (at least in birds and mammals), may be exercised in the preference given among birds to the sweetest or the loudest singers. Unimportant ornamental points may thus be constantly developed by continual selection of small gradations, when they do not interfere with the general efficiency of the organism, till at length we get such highly evolved æsthetic products as the waving plumage of the bird-of-paradise, the sculptured antlers of the gazelle, and the varied song of the mocking-bird. And since, as Mr. Wallace has shown (he himself believes in opposition to, but I rather fancy in confirmation of, Mr. Darwin's theory), these ornamental adjuncts or faculties are most likely to coexist with the highest sexual efficiency, it must happen that in the main sexual selection and natural selection will reinforce one another, the strongest and best being always on an average the most beautiful, and hence the most pleasing to all possible mates.

In this way, I take it, a sense of beauty in the contemplation of their own mates must have grown up amongst all the higher animals, and must have become strongest and most discriminative amongst those whose mates have undergone the greatest amount of ornamental differentiation. And as the secondary differences between man and woman as to beard, hair, and features, are greater than between the two sexes of almost any other quadrumanous animal, we may conclude that man's æsthetic appreciation of beauty in his own species has always been very considerable. Of this æsthetic appreciation, the secondary differences in question are at once the proof, the cause, and the effect. For in the constant action and reaction of heredity and adaptation, it must happen that the greater the original taste, the more will it be exerted in the choice of mates, and the more it is exerted in each generation, the greater will be its effects, and the more will the taste be strengthened in all future generations.

This, then, would seem to be the primitive starting-point of which we are in search. Man in his earliest human condition, as he first evolved from the undifferentiated anthropoidal stage, must have possessed certain vague elements of æsthetic feeling: but they can have been exerted or risen into conscious prominence only, it would seem, in the relation of primæval courtship and wedlock. He must have been already endowed with a sense of beauty in form and symmetry, a sense which, in spite of its wide expansion and generalisation in subsequent ages, still attaches itself above every other object, even with Hellenic or modern sculptors, to the human face and figure. He must also have been sensible to the beauty of colour and lustre,

rendered faintly conscious in the case of flowers, fruits, and feathers, but probably attaining its fullest measure only in the eyes, hair, teeth, lips, and glossy black complexion of his early mates. And he must have been moved, as Mr. Darwin argues, by musical tones and combinations, though chiefly in the form of human song or rhythm alone. In short, the primitive human conception of beauty must, I believe, have been purely *anthropinistic*—must have gathered mainly around the personality of man or woman; and all its subsequent history must be that of an *apanthropinisation* (I apologise for the ugly but convenient word), a gradual regression or concentric widening of æsthetic feeling around this fixed point which remains to the very last its natural centre. By the common consent of poets, painters, sculptors, and the world at large, the standard of beauty for mankind is still to be found in the features and figure of a lovely woman.

Probably primitive man admired his pre-glacial Phyllis or Neæra, admired himself, and perhaps also admired his fellow-man. So far as I can learn, there are no savages so low that they do not discriminate between pretty squaws or gins and plain ones, between handsome men and ugly ones. Our own children appear to me to make the distinction amongst their playmates from a very early age. And in both cases, I am satisfied that their judgment in the main agrees with our own.[1] But it does not seem likely that primitive man took much notice of scenery, of organic beauty as a whole, or even very largely of beauty in flowers, berries, butterflies, and shells. Yet there was an obvious link, a simple stepping-stone, by which nascent æsthetic feeling might easily pass from the one stage to the other. That link is given us in the love for personal decoration.

Not only does every unsophisticated man wish to find a pretty mate, but he also wishes to look to advantage in her eyes and those of his rivals. Similarly, every woman wishes to look pleasing towards all men. The most naked savages take immense pains with their fantastic *coiffures*. Even birds display their beauty to the best advantage, and sing in emulation with one another till their strength fails them. But birds and mammals generally go no farther than this: man can take one step in advance, and add to his natural beauty, or conceal his natural defects, by borrowed plumes. So the earliest evidence

[1] I noticed in Jamaica that the negroes generally considered as pretty negresses the same women as we should ourselves have selected among them: and many persons who have travelled amongst various savage races, and whom I have had an opportunity of questioning, confirm this general conclusion.

of derivative æsthetic feeling which we possess is that of the personal ornaments worn by palæolithic men. Perforated shells, apparently used for necklaces; teeth of deer and other animals; pebbles of rose-quartz and other ornamental stones; wrought pieces of bone or mammoth ivory,—all of them obviously intended for personal decoration—are found in the earliest cave-dwellings and rock-shelters. Feathers and flowers we cannot of course expect to find in such situations; but we can hardly doubt, from the analogy of almost all modern savages, that palæolithic men must have used them as much as they used those other decorative objects. Now, the fact that any such shells or plumes are sought as ornaments proves of course that they were first admired: but the vague admiration originally bestowed upon them would naturally be much quickened and increased by their employment for the decoration of the person. From being vague and indefinite it would become vivid and purposive. Our own children and modern savages take comparatively little interest in flowers in the abstract, flowers as they grow upon the bush or in the field: but they begin to admire them when they pick them by handfuls, and still more when they are woven into a wreath, arranged in a bouquet, or stuck into the hair. Nay, is not this ultimate decorative intent one of the chief *raisons d'être* for many of our European conservatories and florists' shops? Is not a camellia largely admired because it looks so well in a ball-dress, and a stephanotis because it fits so easily in a button-hole? And is it not a fact that many of our ladies and most of our servants admire artificial flowers, with all their stiffness and vulgarity, far more genuinely than they admire living roses or lilies of the valley? We have all known women whose most real æsthetic feelings were obviously aroused by a bonnet or a head-dress.

Flowers are very favourite decorations with the South Sea Islanders, and those who have read Miss Bird's and Mrs. Brassey's pleasant accounts of their stay amongst the Polynesians must have noticed the air of refinement, the vague æsthetic atmosphere thrown over the whole story by their profuse employment of tropical blossoms upon all occasions. Feathers, symmetrically arranged, were the ordinary head-dress of the North American Indians: and they were woven into splendid cloaks by the Hawaiians. Corals, pebbles, precious stones, gold and silver jewellery, cowries, wampum beads, furs, silks, and so forth, follow in due order. Ochre and woad, for dyeing or staining the body, are employed from a very early period. Henna, indigo, and other cosmetics come a little later. Among many existing lowest races, the only sign of æsthetic feeling, beyond the sense of personal beauty and the very rudest songs

or dances, is shown in the employment of dyes or ornaments for the person. Such are many of the Indian Hill Tribes, the Andamanese, the Digger Indians of California, and the Botocudos of Brazil. The Bushmen and to a less extent the Australians, generally ranked in the lowest order, reach a decidedly higher æsthetic level.

In most savage communities, the men, not the women, monopolise the handsomest costumes, which are worn as marks of distinction, not merely as ornaments. But the former use must be necessarily derivative and secondary, not original. Mr. Herbert Spencer has gathered together a large and interesting collection of cases in his *Ceremonial Institutions* (chap. ix.). Nevertheless, the original æsthetic intent of most of such decorations is obvious from the fact that they are universal amongst women, whenever they do not arise from the habit of trophy-taking, as with the use of flowers by the Polynesians generally. So, too, tattooing and other mutilative practices, originally subordinative in their intention, becoming at last merely æsthetic, are prized by women as increasing their natural attractions. Everyone must remember the plea of the New Zealand girls, quoted by Mr. Darwin, who answered the remonstrances of the missionary against tattooing by saying, "We must have just a few lines upon our lips, or else when we grow old we shall be so very ugly". Similarly, Central African women admire their own *pelelé*, the piece of wood inserted in their mutilated lips. I notice in many works of travel that even where the men almost or entirely monopolise the ornaments, the women are always described as displaying great admiration for the beads, red cloth, and other finery taken about by travellers. I may add that I am often struck by the extraordinary folly of missionaries, who habitually preach down the love of ornament on the part of savages or of emancipated slaves (especially the women), when in reality this love is the first step in æsthetic progress, and the one possible civilising element in their otherwise purely animal lives.[1] It ought rather to be used as a lever, by first making them take a pride in their dress, and then passing on the feeling so acquired to their children, their huts, their gardens, and their other belongings.

Such in fact has been, I believe, the actual course of our æsthetic evolution. The feelings vaguely aroused by beautiful

[1] I once asked a West Indian official of great experience and liberal views whether, in his opinion, Christianity had done any practical good to the negroes; and I was much struck by his answering: "Oh yes! It makes them dress up in good clothes once a week, and so gives them an object in life for which to work and save."

objects in the non-practical environment become whetted and strengthened by exercise upon ornaments and pigments, and so extend themselves with increased vividness into new channels. Art, however rude, has especially helped on this primitive progress. The appreciation for the beautiful in man's handicraft leads on to the appreciation of the corresponding beauty in natural objects. I have attempted to trace this reaction, so far as regards the sense of symmetry, in a previous number of this journal,[1] and I shall endeavour still further in the present paper to illustrate its progress in a somewhat different direction.

From delight in the beauty of ornaments to delight in the beauty of weapons or other utensils is but a step. What a man carries in his hands is almost as much a matter for personal pride as what he wears around his neck or his waist. From the very earliest ages, the material for palæolithic stone hatchets seems to have been intentionally chosen with conscious reference to beauty of colour. Amongst the minerals so employed were "red or other coloured jasper"; "greenstone, mottled jade, and green jasper"; "quartz, agate, flint, obsidian, fibrolite, chloromelanite, aphanite, diorite, saussurite, and staurotide". The bone knife-handles and other utensils from the rock-shelters of the Dordogne (of palæolithic date) are admirably carved into the forms of animals, or decorated with ornamental patterns. Indeed, both in outline and detail, most works of art of the chipped flint period show very distinct æsthetic care, which is often marvellous when one considers the extremely rude nature of the tools in use, and the immense extra labour entailed upon the maker by any attempt at unnecessary ornamentation. The weapons of all but the very lowest existing savages show similar marks of æsthetic care. Their stone hatchets, besides being exquisitely polished, like those of the European neolithic age, are fitted in smooth wooden handles, and bound to the shaft by pretty twisted strings of red and yellow fibre. The Australian boomerangs are beautifully worked in hard wood. The staves or clubs of the Admiralty Island chiefs are wrought with the most exquisite and laborious tracery, which puts to shame our careless European wood-carving. The canoe paddles of other Polynesian and Melanesian tribes are models of graceful and effective ornamentation. Among many savages belonging to the second rank, I find few works of art except weapons or like personal utensils on which any high degree of pains has been expended. We may therefore fairly regard this as the second human stage of æsthetic development.

[1] See an article on "The Origin of the Sense of Symmetry," in MIND XV.

Hardly superior to this second level is the love for decoration on vessels and other domestic utensils. Yet these, as being just one degree less personal than weapons, may be regarded as occupying a slightly higher stage. Calabashes and cocoa-nuts are almost always carved or decorated. Pottery from the very first is more or less ornamental in form, and even amongst very undeveloped savages is often prettily moulded with lines or string-courses. Many of Dr. Schweinfurth's Central African specimens are extremely graceful; while several of the exquisitely simple prehistoric forms unearthed by Dr. Schliemann at Troy and Mycenæ have been adopted as effective models for the modern artistic Vallauris ware. France itself can produce nothing more beautiful in its own kind.

Decoration of the home is one degree more disinterested than decoration of the person or personal implements. The palæolithic savages who carved the knife-handles and etched the pictures of rein-deer or mammoths in south-western France, still lived in caves and holes of the rock. But as soon as man began to dwell in a hut, that hut began to take the impress of his growing æsthetic tastes. Swiss lake-dwellings present regular square or circular ground-plans. Esquimaux snow-houses are finished with as much regularity and neatness as if they were built in the most durable material. Almost all savage huts are picturesque in shape, and some are even artistic in their simple style of architecture. The rudest tribes care for little but the exterior of their dwellings, since the interior is only used as a shelter for sleeping or a retreat from wet weather, not as a place of reception. Pride in personal possessions, we must always remember, has uniformly formed the stepping-stone on which our nature has slowly risen to a higher æsthetic level. So, we find houses beginning to be ornamented internally just in proportion as they are used for purposes of display. Even our own homes usually have the drawing and dining rooms much more elaborately decorated and furnished than the other parts of the house. The state-apartments of halls and palaces contain all the best pictures and the handsomest mosaic tables that their owners possess.

At this stage, the governmental and ecclesiastical impetus begins to be strongly felt. From the very beginning, indeed, æsthetic products are specially the attributes of royalty and divinity. The clubs and paddles noted above are those of chiefs alone: the Hawaiian feather mantles were *tabu* to the royal family: the ivory sceptre and the vermilion-painted face "belonged alike to the Roman god and to the Roman king". But when we reach a state of culture at which the royal palace and the temple are widely different from the huts of the subject,

we find a great æsthetic advance. Architecture is indeed a specially regal and religious art. All early buildings of any pretensions are either palaces or shrines: only at a comparatively late stage of evolution, and under an industrial *régime*, do handsome mansions of commoners begin to exist. Even in our own day, if we see an exceptionally large and pretentious house, we take it for granted that it is, if not a palace, at least a public building. In India, all the great architectural works are either mosques and temples or palaces and mausoleums of native or foreign rulers. In Egypt, they are either pyramids of dead kings or fanes of still earlier gods. So, too, in Mexico, Peru, Central America. The catalogue of the works of art in Solomon's temple and Solomon's house, whether authentic or not (and good authorities accept it as historical), represents at any rate the æsthetic status of the Hebrews at the date at which it was committed to writing.

The king, then, from the first surrounds himself with such natural or artistic products as add to his impressiveness and dignity. Trophies and other decorations of warlike origin, badges and costumes, paint and ointment, have been so fully treated in this connexion by Mr. Herbert Spencer in his *Ceremonial Institutions* that I need not dwell upon them further here. But a few words as to later and more developed stages may not be out of place. Architecture is the central royal art, and its first object is to "beautify the house of the king". Beginning with the regal hut, it goes on to the frail and gilded palaces of China and Burma, the house of cedar which King Solomon builded, the vast piles of brick erected by Assyrians and Babylonians in the alluvial valley of the Euphrates, the solid granite colonnades of Thebes and Memphis, the huge marble domes of Agra and Delhi, the stucco monstrosities of Mohammedan Lucknow. Sculpture first grows up as the handmaid of architecture, and begins its modern form with the bas-reliefs of Egypt and Assyria, or the rock-hewn colossi of Elephanta. We still see the conjunction between royalty and these two sister arts in the beautiful Renaissance façade of the Louvre and the tasteless gilding of the Albert Memorial. Beside the ancient Nile or in the courtyards of Nineveh, we find the subjects ever the same—the king conquering his enemies: the king hunting and slaying a lion: the king driving a herd of naked captives to his capital city. Thus the aggrandisement of royalty becomes at the same time the opportunity for the exercise and development of plastic skill, while it affords models of the beautiful in art for the admiration and the æsthetic education of the subject throng.

Similarly with painting. Beginning with the rude decoration

of the savage cloak and girdle, it advances to the smearing and gilding of the royal hut. Thence it progresses to the brilliant colouration of Egyptian columns and frescoes, and to all the Memphian wealth of blue, green, crimson, and gold with which so many modern restorations have made us familiar. In India, debarred from imitation by Moslem restrictions, it produces the exquisite decoration of the Taj and the Delhi palaces: in western Islam, it gives us the gorgeous Mauresque tracery of the Alhambra. In its regular European development, becoming mainly ecclesiastical during the early middle ages, it reasserts its original governmental connexion in the palaces of Florence and Venice, in the Vatican, in the Louvre and the Luxembourg, in Whitehall and Hampton Court, in Dresden and Munich, in modern Berlin and St. Petersburg. Sèvres and Gobelins were originally royal factories: Giotto, Michael Angelo, Raphael, Holbein, Rubens, Vandyke, all produced their masterpieces for popes or kings—Leo X., Henri IV., Charles I. Conversely, American artists have often noted the chilling effect of the want of a court upon the æsthetic susceptibilities and creativeness of their countrymen generally. Europe has, on the whole, purchased its art at the hard price of its long apprenticeship to despotism. In India, native art has steadily died out with the gradual extinction of the native courts. In Hellas and Italy it happily survived royalty because pressed into the double service of religion and of the sovereign people in its corporate capacity. What the house of Pharaoh was to Egypt, that was the house of Athene to Athens.

The gods, indeed, have done almost more for the expansion of the æsthetic faculty than even the kings. If the savage decorates the living chief and his house, how much more must he decorate and beautify the image and the house of that greater dead chief, the god—that ancestral ghost whom even the living chief dreads and venerates exceedingly. Hence, from the very first, while the ornaments of the king and the god are the same in kind, those of the god are the finest in degree. As the ghost gradually expands into the vaguer grandeur of the deity, his worship is surrounded with increasing magnificence. It is the temples of Heliopolis and Benares which naturally occur to our minds when we think of Egyptian or Indian architecture. It is the pyramids and mausoleums that form the initial stage of ecclesiastical buildings. All the world over, the shrines of the gods are the most splendid of all erections: only where faith is on the decline do we find the palace or the mansion outvying the cathedral and the chapel. In architecture, in sculpture, in painting, in music, the homes of the gods are the highest expression of national æsthetic feeling. Passing from the

painted pillars of Karnak to the temples of Khorsabad and the mosques of Agra, we find the same care everywhere bestowed upon the service of the deities. In Hellas, we have the Parthenon and the Theseium; we have the chryselephantine statues of Pheidias, and the votive tablets of Praxiteles. The marbles of Pentelicus or Paros permitted the Hellenic Aphrodite to assume a graceful and natural pose which would have been impossible with the stiff granite limbs of a Pasht carved out from the quarries of Syene. At Rome, we have the Capitoline Jove, yielding place at last to the palace of the Divus Cæsar and to the basilica of the Christian apostle. All classical architecture, all classical sculpture, the larger part of classical painting, and no small part of classical poetry, are directly due to the influence of the old Helleno-Italian religions. And whatever little information we can gather of the æsthetic status of the Hebrews is to be derived from the story of the hangings and vessels of the tabernacle, and the molten sea, the pillars, the bases, the lavers, and the cedar ceiling of Solomon's temple. Hebrew poetry is almost without exception devotional.

In Christian times, the connexion between art and religion has been even more noticeable. Our music is directly affiliated upon the Gregorian chant, and derives its notation from ecclesiastical usages. Masses and oratorios still compose its masterpieces. Our painting has come down to us from Byzantine and early Italian models, and found its home during the whole mediæval period in the great cathedrals and churches of Italy, whence it spread to the palaces of the Florentine Medici, of the Venetian doges, and of the Genoese merchant princes, and so ultimately to north-western Europe. The whole character of pictorial art up to the Renaissance was entirely ecclesiastical and devotional. We have fed and nursed our taste upon Madonnas and Holy Families, upon Crucifixions and Assumptions, upon St. Sebastians, St. Johns, and St. Cecilias. Our architecture is based upon the Romanesque Christian church, whose rounded forms melt into the pointed arches of the Gothic cathedral. It finds its noblest expression in Pisa and Poitiers, Milan and Venice, Cologne and Chartres, Lincoln and Salisbury. And when the classical revival comes to restore the older schools, it produces the masterpiece of its newer style in the vast dome of St. Peter's, where the four chief arts, architecture and sculpture, painting and music, all alike find their chosen home in the central point and focus of Catholic Christendom.

Nor is it only in these more notable forms that royalty and religion influence æsthetic taste. The purple and fine linen of king's palaces; the inlaid cabinets and parquetry floors; the jade vases and painted porcelain; the Dresden statuettes and

bronze candelabra; the frescoed ceiling, tapestry wall-covers, and carved wood-work; all these belong to the royal home. Even in poetry, the Queen still keeps her Laureate: and the drama, originally a sort of royal speciality, is still performed at Drury Lane by "Her Majesty's Servants". Similarly with religion: the stained glass window and the marble or mosaic altar; the costly vestments and sweet-perfumed incense; the fretted roof and the sculptured reredos; these in their turn belong to the worship of God. Such royal decorations and sacred ornaments react again upon the popular taste, both actively and passively. As an active effect, they give rise to and foster artistic workmanship: as a passive effect, they educate and strengthen the æsthetic faculties of the mass. Amongst the lower races, the æsthetic feelings have been closely linked with the sense of proprietorship: amongst the higher races, they gain more and more with every step in abstractness and remoteness from the personality of the individual. It was in the vast cathedrals of mediæval Europe that modern æsthetic feeling received its early education.

So far we have treated little of beauty in nature: beauty in art has occupied almost our whole attention. The latter prepared the human mind for the appreciation of the former. Of the manner in which the love for art passes into the love for smaller natural objects, which exhibit minute beauty of workmanship, I have already treated elsewhere: but the taste for scenery demands a few words here. Children and early races care little for nature: it is only among the most cultivated classes of the most advanced types that the æsthetic faculty reaches this its highest and most disinterested stage. All art is at first frankly anthropinistic. Early painting, such as that of the Egyptians and Assyrians, dealt only with human and animal figures: it represented men and women, kings and queens, gods and goddesses, hunters and lions, herdsmen and cattle: but it never attempted landscape or scenery. Mediæval art in its early stages only changed its characters to saints and angels, priests and bishops. But as it progressed from its Byzantine type, it also gradually gave more and more importance to accessories in the back-ground, in which hills, cities, rocks, and trees, began to play a conspicuous part. At last, after the Renaissance, landscape painting became a recognised and separate branch of pictorial art, first with an admixture of figures, wild animals, or still life, but afterwards in a more fully differentiated form, with all its varieties of marine, architectural, forestine, or river subjects, its waterfalls, its clouds, its rocks, its valleys, and its heather-clad hills. Even in our own day, very young people and the uncultivated classes care little for any

but figure-painting: children pass over the landscapes in their picture-books, and fasten at once upon the man on horseback or the boy with a top. The first object they try to draw for themselves is a human face. So, too, with literature. All primæval literary works consist of a legend, a story historical or mythical, the tale of what some man or some god has done. To the very end, novels, plays, and biography, the most human in their interest, are the favourite forms of literature. Poetry at first is all epic or narrative: lyric and descriptive verse only come in at a much later point of evolution, and are seldom thoroughly relished by any but the most cultivated. "Tell me a story," says the youngest child: "History is the most delightful of studies," says the Roman philosopher.

We may take the Homeric poems as an excellent illustration of human æsthetic feeling in this its naïvely anthropinistic stage. In them we find human beauty abundantly recognised and admired. Helen, for whose sake Trojans and Achaians may well contend through ten long years; Paris, on whose eyes and hair Aphrodite pours the gift of loveliness; the golden locks of Achilles, the white arms of Here, the hazel eyes of Athene, the fair cheeks of Briseis. There is much admiration, too, for works of primitive art—the golden-studded sceptre, the polished silver-tipped bow of horn, the jewelled girdle of Aphrodite, the wrought figures on Achilles' shield, the embroidered pattern on the many-coloured peplum which Theanô offers on the knees of Athene. The palaces of Priam and of the Phæacians excite the warmest praise of the rhapsodist. But of scenery there is little said, as is also the case in the Hebrew poets. The garden of Alcinous is, after all, but a well-ordered fruit-orchard. Nature is only alluded to as a difficulty to be overcome by man—the barren, harvestless sea; the high, impassable mountains; the forests where roam the savage wild beasts. In the Periclean age, we have a higher but still not a very exalted standard as regards natural beauty; the *Bacchæ* of Euripides being the high-water mark of Athenian love for the picturesque, and standing out in this respect as a solitary example amongst its contemporaries. With the greater security of Roman rule, life became less confined to the immediate neighbourhood of cities; mountains and forests and waterfalls became more easy to visit; and in the *Georgics* we see the result of the change. Yet even in the *Georgics* the view of nature is still very anthropinistic, and the feeling for scenery decidedly urban. What should we say of a poet now-a-days who should apostrophise the beauties of an Italian lake "Fluctibus et fremitu assurgens, Benace, marino"? Would he not seem in our eyes to have missed entirely the whole spirit of the scene? The words might do for

Huron or Ontario, but fancy applying them to Como or Garda! Nevertheless, the Roman mind had decidedly advanced in the love of nature. The Alps were still to Juvenal mere masses of snow barring the way from Gaul to Italy; the ocean was still to Tacitus a boundless waste of western waters: but the falls of Tivoli, the little fountain-head of Bandusia, the sweeping coast-line of Baiæ, the beetling crags of Terracina, the deep volcanic basin of the Alban lake—all these could rouse æsthetic admiration and delight in the eyes of a Horace, a Virgil, or a Claudian. With the recession of the middle ages, when men were again confined to the narrow limits of towns, æsthetic feeling went back once more to the naïve anthropinism of an earlier age: but since the Renaissance, the love of scenery has grown perpetually, and it now probably reaches the furthest development that it has ever yet attained.

But we must never forget that the taste for scenery on a large scale is confined to comparatively few races, and comparatively few persons amongst them. Thus, to the Chinese, according to Captain Gill, in spite of their high artistic skill, "the beauties of nature have no charm, and in the most lovely scenery the houses are so placed that no enjoyment can be derived from it". The Hindus, "though devoted to art, care but little if at all for landscape or natural beauty". The Russians "run through Europe with their carriage windows shut". Even the Americans in many cases seem to care little for wild or beautiful scenery: they are more attracted by smiling landscape-gardening and, as it seems to us, flat or dull cultivation. I have heard an American just arrived in Europe go into unfeigned ecstasies over the fields and hedges in the flattest part of the Midlands.

The reason for this slow development may be briefly traced. The minor component elements of scenery must always have been to a great extent beautiful on their own account even to children and savages. Thus, the same bright colour which gave attractiveness to flowers and gems must also have given it, though more vaguely, to the rainbow and the sunset clouds, which could not similarly be utilised for purposes of ornament. Colour must also always have formed an element of beauty in blue sky and sea, red sandstone cliffs, white chalk, green meadows, and golden corn fields. All these objects, however, being comparatively remote from personal interest, would be little regarded by the primitive mind. But when cultivation began, the care of the husbandman and the æsthetic interest aroused by his regular neatness would naturally set up a new feeling. Straight rows of vines or olives, trim meadows, well-kept hedges, level fields of corn excite the farmer's admiration. This is about the level ordinarily reached (though often sur-

passed) by the *Georgics*. In the *Iliad*, when a place is mentioned with any allusion to scenery, it is generally because it is "fertile," "horse-feeding," or "rich in corn": with Virgil, it is the careful tillage of Italian peasants that provokes attention. But wild hills and rocks are mere barren good-for-nothing wastes to the agricultural eye. A few days before writing this paper I was wandering among the beautiful wooded heights of the Maurettes near Hyères, when I came across a party of peasants taking their lunch on a little plateau outside their cottage. Wishing to apologise for my intrusion, I said a few words about the singularly lovely view which their house commanded across the mountains and the sea. "Ah, yes," said one of the peasants in his Provençal *patois*, "there isn't much to see this way except the forest: but down there," pointing behind him in the opposite direction, towards the great cabbage-garden which covers the alluvial plain of Hyères, "down there one sees a magnificent country". The one view was like a bit of miniature Switzerland; the other, like a huge market-garden, as flat as this page.

Even in our own time and place, amongst our own race, one may see a similar æsthetic level with farmers and labourers. "So you're going to Devonshire," said a Lincolnshire yeoman to his minister (from whom I have the story): "you'll find it a poor sort of country after this. You'll never see a field of corn like ours down there, I take it." "Your country, sir," says a distinguished American visitor in England, "is very beautiful. In many parts, you may go for miles together, and never see a tree except in a hedge. Nothing more beautiful can be conceived." (I take the words down from the report of an "interviewer".) To the farmer, hills like those of Devonshire were mere obstructions to ploughing: in the eyes of the practical American, trees were simply objects to be stumped and annihilated in the interest of good farming.

So long as communications are difficult and roads bad, this agricultural aspect of natural beauty will remain uppermost. It is difficult to appreciate scenery in the midst of practical discomforts. The Alps were naturally mere barriers of snow to Hannibal and Cæsar. The Scotch highlands were less beautiful to lowlanders when they were inhabited by hostile clansmen with a taste for cattle-lifting. Even in the last century, one is struck by the many serious discomforts which Johnson suffered in going to the Hebrides or travelling through Wales. Telford's Holyhead road must have done much to quicken the æsthetic sensibilities of the eighteenth century in England. I have myself noted in Jamaica how much the appreciation of really beautiful scenery is spoilt by the discom-

forts of the climate and the difficulties of transport. In such circumstances, an æsthetic feeling for scenery can hardly develop itself. Still less could it do so during the perpetual state of siege in the middle ages, or the constant warfare of the little Hellenic republics, when no man could travel a few miles from home save on urgent business and with due precautions. A lovely pass or a frowning gorge can hardly become beautiful in the eyes of those who see in it everywhere a lurking brigand.

On the other hand, when travelling becomes easier, a taste for scenery naturally arises. All the mental elements of the taste are already present; only their combination is wanted to complete the æsthetic growth. Tastes educated and refined by the arts of the city must find beauty ready to hand in much of the country. The garden and park, the Italian terrace and the Versailles avenues, the ornamental grounds and artificial lakes of the last century, formal as they seem to us now, show the gradual growth of the taste. A view from the castle or the hall becomes a desideratum. To look out upon fresh green fields and trees rather than upon the walls and narrow streets of a city must always have been pleasant to all but the most restrictedly anthropinistic minds—though even in our own day there are many townsmen who would find more to interest them in a crowd of people than in the loveliest scenery on earth. Again, only highly cultivated minds can thoroughly enjoy the beauty of places which have been always familiar from childhood: and we can hardly expect a taste for scenery to develop amongst people who necessarily live (like all but the most civilised) in one narrow place for all their days. Under such circumstances, the perception of its beauty can never arise. The habit of making tours, at first confined to the very wealthy, but gradually spreading down to the middle classes and the mass, has undoubtedly had an immense effect in strengthening the love of nature. Those who only know the stercotyped features of their own suburban fields, often flat and unlovely, cannot acquire any deep interest in scenery. But when Wales and Scotland, Auvergne and Brittany, Switzerland and the Tyrol are thrown open for us all, the habit of comparing, observing, and admiring grows upon us unawares. Those railways which Mr. Ruskin so cordially despises have probably done a thousand times more for promoting a love of beauty in nature than the most eloquent word-painting that was ever penned even by his own cunning and graceful hand.

If one may trust an individual experience, it is not the first waterfall that charms the most. Niagara itself, when seen in early youth, does not produce nearly so strong an impression as the little Swallow-Fall at Bettws-y-coed in later years. The

more one sees, the more one learns what to expect, what to observe, what to admire. Here it is the wind-shaken foam-streak of the Staubbach ; there, the little dancing cascades of the Giesbach ; and here again, the vast unbroken emerald-green sheet of the Horse-Shoe Fall, pouring in ceaseless majesty into the seething turmoil of waters at its mist-begirt feet. Each has its own beauties of grace, prettiness, or sublimity, and each is largely apprehended and appreciated by means of half-unconscious recollections of the others. Between the American and Canadian falls at Niagara, a little belt of water forces its way through the gap which severs Goat and Luna Islands, and forms a minor cataract of its own, hardly heeded in the presence of the two great rivers plunging headlong at its side. If one fixes one's attention for a few moments on this little sheet of foam, one recognises after a while that it is really larger than any cascade in western Europe. And if you then turn your eyes to the vast semicircle of deep green water on your right, you feel at once that without that standard of measurement your eye and brain would have failed adequately to grasp the mighty dimensions of Niagara.

Thus, step by step, in our own individual minds, and in the history of our race, the æsthetic faculty has slowly widened with every widening of our interests and affections. Attaching itself at first merely to the human face and figure, it has gone on to embrace the works of man's primitive art, and then the higher products of his decorative and imitative skill. Next, seizing on the likeness between human handicraft and the works of nature, envisaged as the productions of an anthropomorphic creator, it has proceeded to the admiration for the lace-work tracery of a fern or a club-moss, the sculptured surface of an ammonite, the embossed and studded covering of a sea-urchin, the delicate fluting of a tiny shell. Lastly, it has spread itself over a wider field, with the vast expansion of human interests in the last two centuries, and has learnt to love all the rocks and hills and seas and clouds of earth and heaven for their own intrinsic loveliness. So it has progressed in unbroken order from the simple admiration of human beauty, for the sake of a deeply-seated organic instinct, to the admiration of abstract beauty for its own sake alone.

GRANT ALLEN.

II.—THE UNITY OF THE ORGANIC INDIVIDUAL.[1]

IV.

All essential properties of the living substance remain unexplained. Their origin and interdependence are as enigmatical as ever. It is indeed well known that nutrition, growth and reproduction, heredity and adaptation, motility and sensibility, are organic powers actually at work in nature; for their sundry manifestations visibly intermingle, and give rise to all the manifold vital performances exhibited by living beings. It is also well known that the complex organism is differentiated into specific tissues; for the respective positions and properties of these tissues are everywhere studied with the utmost precision. But concerning the intimate molecular operations that originate the fundamental vital activities, science is, as yet, completely in the dark, and it is in the dark also concerning the conditions that determine the position and the differentiation of tissues.

We have found, on close examination, that all these fundamental vital occurrences have resisted elucidation, even when attempted by the foremost investigators. Thus the science of life is still left adrift without any first principles to guide its intricate course. Shall we then, for the present, abandon the task as premature? Or shall we pronounce it altogether impracticable?

Where masters have failed, surely I, their obscure disciple, would never venture to come forward with a view of my own. But it so happened that by some fortunate accident nature allowed herself, as I believe, to be caught in my presence without her usual impenetrable guise. I could not help seeing what others have so long sought for in vain. By some strange fascination I was drawn into giving careful attention to the peculiar amœboid movements displayed by homogeneous protoplasm. Day after day, and month after month, for five years (1872-7), I kept close watch on those slow and monotonous movements. From near and far a vast array of specimens were gathered, showing every imaginable variation of this one central activity—the pushing forward and the retracting of projections. Here, as it seemed to me, vitality was caught in tentative operation, transparent and unmasked by any morphological complications. If perseverance could ever solve the mystery, it must now yield.

[1] Concluded from Mind XIX., pp. 318-36.

I followed the sluggish current of hyaline material, issuing from globules of most primitive living substance. Persistently it forced its way into space, conquering, at first, the manifold resistances opposed to it by its watery medium. Gradually, however, its energies became exhausted, till, at last, completely overwhelmed, it stopped, an immovable projection, stagnated to death-like rigidity. Thus, for hours perhaps, it remained stationary, one of many such rays of some of the many kinds of protoplasmic stars. By degrees then, or sometimes quite suddenly, help would come to it from foreign but congruous sources. It could be seen to combine with outside complemental material drifted to it at random. Slowly it would thereby regain its vital mobility, shrinking at first. But gradually, completely restored, and reincorporated into the onward tide of life, it was ready to take part again in the progressive flow of a new ray.

On the other hand, I watched also the brisk current of more highly elaborated but still homogeneous protoplasm, proceeding in unbroken continuity and direct line through space, never fully overcome by normal surroundings, but always replacing its foremost substance, as quickly as it became shattered against the powers of the medium, the whole molecularly mobile being constituting a continuous flow of ever-renewed life, forward-pressing, and triumphing over the disequilibrating forces, by dint of prompt and adequate reintegration.

So I continued watching and pondering, till it all seemed clear to me, till these primitive displays of vital activity had disclosed—to the satisfaction of my own mind—the constitution and interdependence of the elementary properties of life, and therewith also the conditions of primitive organisation.

It was Haeckel who discovered monera, and who was the first to point out their fundamental importance to biology. He says himself:—"Monera obviously prove that our conception of the organism has to be derived dynamically, or physiologically, from its vital movements, not statically, or morphologically, from its organological composition." "Life is not a consequence of organisation, but, on the contrary, it is the formless protoplasm that builds up organised forms." Nothing could be more lucidly conceived than the ideas expressed in these memorable sentences. They were evidently inspired under the immediate influence and observation of the undifferentiated living substance. By clear implication, they proclaim the molecular unity of the organic individual. If the unbroken cycle of molecular motions inherent in formless protoplasm is the source of life and organisation, then surely the higher this life, and the higher this organisation, the more complete and perfect must be that

unbroken cycle of molecular motions that sustain them. Break up into many separate and autonomous morphological elements the unity and continuity of life, so unmistakably embodied in the molecular process constituting protoplasm, and where, in reality, is there left the bond which holds together the dissevered portions of the vital and organic nexus? There remains, indeed, nothing but hyperphysical ties and supernaturally established harmonies, where, at the beginning, we had it all consistently encompassed within a single material and self-sufficient unity.

Haeckel's cosmological and biological preconceptions hindered his thorough appreciation of the truths so strikingly demonstrated in the vital manifestations of monera. The fundamental error that prevented the keen and philosophical discoverer of these morphologically undifferentiated beings from gaining an understanding of the true nature of their substance is the same old error that is everywhere else obstructing the understanding of life. It is that notion of bare Aggregation which to-day forms the working hypothesis and ultimate postulate of all our sciences; it is the metaphysical assumption that two and two make four without a combining medium. Atoms aggregate to molecules. Molecules in the inorganic world aggregate to crystals; in the organic world to living morphological units; the climax of all this grouping being reached at last in the aggregation of the morphological units to complex organisms. So the universe, *in toto*, is believed to be constructed out of nothing but atoms variously grouped.

In a former section of this article we have seen how Haeckel, in faithful adherence to the mechanical hypothesis, felt obliged to invoke the aid of metaphysical powers in order to impart reproductive energy to his organic mechanism. We now find his profound conception of life and organisation, as resulting from a dynamical process and not from a juxtaposition of units or parts, vitiated by just the same fundamental error—the endeavour to produce qualitative combinations by mere multiplication and arrangement of equal elements. In keeping with this view, the protoplasm of monera is held to represent an aggregate of equal molecules. It follows that in each such molecule there must then reside undivided all the elementary properties of life, and, in this case, the subsequent development of vital manifestations can only be due to the combination of the energies of multitudes of such elementary units diversely grouped. Equality, however, puts a stop to every progressive movement, and takes the life out of any co-operative system. In organic nature, equality of constituent units or molecules means simply the dissolution of the chemical nexus of protoplasm, and with it the cessation of the intense vortex of life. It means death-equilibration, final victory of the

inorganic powers over the great microcosmic molecule, all-resisting and all-comprising, but now rapidly falling to pieces, its bondless material soon finding a quiet and uneventful level in ever so many equalised units of CO_2, H_2O, and NH_3.

It is thus that Haeckel has scientifically suppressed the vital activities at their point of origin, effectively stopping the dynamical process from which he hoped to see organisation result. Organisation, however, does in all reality result from the dynamical play that sustains the living substance, and it is our principal task to show exactly how this occurs.

Here it will be well to remember the marvellous complexity of those confessedly unicellular beings, the ciliated infusoria. Paramaecium aurelia, previously described (MIND XIX. 328), with its all but complete organisation, cannot possibly represent a mere aggregate of equal plastidules. Here, at any rate, it is positively demonstrated that the protoplasm of a single cell—leaving the nucleus, at present, out of consideration—that the protoplasm of Paramaecium aurelia must consist of a definitely interdependent series of highly differentiated molecules. Surely, it must be a most specific bond of union which thus harmoniously maintains the structural diversity and permanent shape of this morphological unit; a most specific chemical cycle, which thus coerces its continuous protoplasm into the complete variety and concourse of organic divisions.

If the problem of organisation is not solved here in its unicellular form, where it is presented to us in all its main features without farther morphological perplexities, how can we ever hope to gain an insight into it after each of these fundamental features has, in the course of development, undergone a series of most puzzling complications?

Why then is this morphological unit constructed such as it is? Why is it thus shaped? Why has it an oral and an aboral pole, an integument, a contractile layer, a digesting substance, &c., &c.? These are questions which sound strange indeed, almost as if emanating from the school of Schelling and Oken; yet it will presently be seen how completely justified they are from a strictly scientific point of view.

Here is a clear-cut protoplasmic ovoid flowing evenly along, straight across the field of the microscope. We will not let it slide by without closely scrutinising its activities; for, after carefully examining them, it will seem as if this morphologically undifferentiated organism had been made on purpose to reveal to us the secret of tissue-formation. It embodies all the essential traits of organisation, but organisation not yet structurally fixed. Like our Paramaecium it also maintains a definite shape. It is bilaterally symmetrical. It has an oral and

an aboral pole, an incipient integument and contractile layer, a digesting substance, a depurative vesicle peculiarly situated. It takes food in only in front, retains it till digested in the centre of its body, and eventually evacuates the residue at the aboral pole. There can be no doubt it constitutes a complete organism with definitely determined positions for all its parts. Yet it can be readily ascertained that it consists, nevertheless, of nothing but a fluent mass of molecularly coherent protoplasm. We have here before us a single unit of living substance, fluent through and through, and exhibiting notwithstanding a strictly localised distribution of organic divisions and functions; we have before us a living vortex, maintaining itself, and advancing head foremost through space.

Much of the mystery of vitality and organisation will have disappeared when this issuing-forth of vital motion, and this fluent shaping of organic divisions, will have become intelligible to us. All the differently functioning regions of our vital vortex gain their peculiarities merely from the special position which they occupy in the chemical cycle that constitutes protoplasm. We have here, indeed, essentially one and the same substance performing all the sundry organic offices; but it is by no means one and the same substance in one and the same state of efficiency. It is a complex chemical circuit that gives rise to the definite location of all the chief differentiations of the organism; and it is the same substance at the different stages of this its chemical circuit, which, by means of its specifically changing relations, becomes in turn the seat of all the main performances of vitality. We can with our bodily eyes follow this shaping and organising circuit:—From the neighbourhood of the digesting protoplasm within the body of our fluent ovoid there emerges a continuous flow of finely granulated material, and farther on in front there issues from the granular matrix a perfectly hyaline substance. This foremost, expanded, hyaline substance suffers disintegration at its surface of contact with the medium, and is then thrust aside by the bursting forth of new expanding material. The disintegrated protoplasm slides down along the outer surface of the moner, forming there a gradually contracting envelope, which, at last, closes in at the rear, completely collapsed, and ready to re-enter the renovating, ascending current. Food coming in contact with the foremost portion of the moner gets wrapped up in a coat of the protoplasm, which it thus touches, and is lodged with the same as a nutritive corpuscle in the centre of the body. Between the disintegrated protoplasm gathered in at the rear and the stationary deposit of food, generally one single depurative globule ministers both to functional and to nutritive depuration.

We know now for certain, for we have accurately witnessed it with our own eyes, that the fundamental features of organisation assumed by the living substance are the result of the same chemical cycle by which this very substance is itself formed and maintained. However important in itself this truth may be, its acquisition throws light only on one part of our problem. There remains to be shown what the exact conditions are that give rise to and that sustain the chemical cycle, which has been disclosing itself so plainly as the true source of vitality and organisation.

Vitality is from the very start a complex activity, a variously related process. It can never be derived from forces inherent in a chemically occluded molecule, in a molecule from which no constituent atoms become dissociated, and with which no outside atoms become integrated. The disintegration and reintegration of the protoplasmic molecule is the fundamental exertion and essential procedure of life, its very being. You may fit out an ever so complex organic molecule with ever so many physical and psychical endowments; yet such a molecule, chemically occluded, can take part in evolution only by an intrinsic rearrangement of its own atoms, never by the procreation of more molecules of its own kind, or of any kind whatever. Its vital energies are hopelessly locked up within its own material allotment. But we need not speculate any further on this radical topic. Direct observation will furnish us with positive knowledge on just the point we are so desirous irrefutably to establish. We clearly perceive that the hyaline substance of a protoplasmic projection becomes disintegrated by its exposure to the normal influences of the medium. We know for certain that the change which it has visibly undergone represents not merely an isomeric modification, but a genuine chemical change. We are sure of this, because we distinctly see the products of disintegration gathering into a separate globule, and being then, in a liquid state, discharged into the medium. After a while the disintegrated protoplasm of the projection is observed to combine with selected foreign substances, and thereby to regain its former properties. Consequently, we can conclude that it has become reintegrated by union with complemental material. The actual occurrence of such a chemical process satisfactorily proves that, whatever molecules have taken part in the change, one or many, they have certainly suffered dissociation of some of their own atoms, and have then reintegrated themselves by appropriation of other atoms derived from outside sources.

In this one elementary action of molecular disintegration and reintegration, consists the germ of all life, and of all organic

evolution. The development of organic forms is due to the elaboration of the different phases of this one central event. A complex organic molecule suffers disintegration through the dynamical impulses of the medium. By dint of its own intrinsic affinities it then reintegrates itself with complemental material.

The first phase of this elementary act of life represents the impressibility of the protoplasm, its faculty of getting chemically disturbed through the influence of certain dynamical forces, but disturbed only within definite and recoverable bounds. It is this side of the molecular process which develops into the life of cosmic relations, the so-called animal life.

The second phase represents the chemical affinity of the protoplasm to certain specific materials, and develops into the life of chemical relations to restitutive substances, the so-called vegetal life.

The ectoderm is the structural realisation or, in other words, the morphological organisation of the relations of the living substance to the sundry dynamical or disintegrating powers of the medium. The entoderm is the structural establishment of the relations of the living substance to its chemical or reintegrating resources.

We may legitimately allow ourselves to imagine that, at the dawn of life, the primitive protoplasm stood in direct chemical continuity with adjoining material, which material fitted exactly into the chemical gap produced by the disintegrating influences.[1] This simple and direct relation obtaining during the early stages of protoplasmic elaboration became, however, more and more complicated in proportion as organic evolution progressed. On the one hand, the development of the life of dynamical relations, or—what amounts to the same thing—the development of its structural embodiment, the ectoderm, called for more and more elaborate restitutive material. On the other hand, the growing incongruity of the raw material furnished by the medium for restitutive purposes, necessitated a series of preparative processes. These organic prerequisites are met by one portion of the common protoplasm being partitioned off exclusively for food-digestion and food-assimilation.

[1] I have not discovered any moner demonstrating this most primitive stage of restitution. But I have found several kinds whose processes could never be seen to combine with any solid food-particles, though I watched these beings sometimes for 18 consecutive hours. The stagnant projections, after long exposure to the mere fluid medium, would very gradually regain their mobility. A distinct residual flake, however, slowly gathering within the body of the moner and eventually ejected, proved that the restitutive material had not been exactly complemental.

At first, any portion of the protoplasm that happens to come into contact with food, forms with the same, by dint of their mutual chemical affinities, a circumscribed globule, in which the elaboration of the restitutive material is effected. In monera, in amœbæ and in many ciliated infusoria these nutritive corpuscles may occupy any interior portion of their protoplasm. But in other ciliated infusoria, in our Paramaecium, for instance, the nutritive corpuscles are formed at the extreme end of the gullet by a peculiar whirling process,[1] in which minute food-particles are intimately mixed with protoplasm. The nutritive corpuscle thus constituted descends then into the hindmost portion of the granular substance, occupying the space between the ectoderm and the walls of the gullet. There it finds itself in close proximity to a depurative vesicle. A turbulent chemical process ensues in the nutritive corpuscle between its food-particles and its protoplasm. The depurative vesicle discharges in rhythmic contractions the products of decomposition yielded by this first stage of the digestive process. It requires from six to twelve depurative pulses to render the nutritive corpuscle fit for its long journey through the granular protoplasm, which it pursues along the definite currents of this fluent substance, till digestion is fully completed and its useless residue evacuated through the aboral aperture.

In other infusoria we find a localised digestive cavity with the beginning of a distinct and permanent entodermic structure. One large nutritive corpuscle occupies the centre of the body of these worm-like infusoria. The peripheral portion of this nutritive corpuscle forms part of the permanent entodermic structure, which fact can be readily ascertained, when—as occurs from time to time—the central portion of the nutritive corpuscle is evacuated through the mouth to make room for new food.

All entodermic structures represent further developments of this digestive operation, by which the elaboration of restitutive material is effected. The preparation of adequate restitutive material is the formative cause, as well as the functional office of the entoderm. The direct chemical relation, which primitively existed between the protoplasm and its food or restitutive material, is indirectly maintained in higher organisms by the interposition of a definite series of preparatory stages structurally represented by the entoderm. The entoderm furnishes to the higher organism the adequate restitutive material which the lowest organic forms derived directly from the medium.

[1] By feeding with indigo or carmine this shaping of nutritive corpuscles can be made very striking.

In vegetables we find an immediate chemical relation, even to inorganic materials, still preserved. Inorganic compounds make up the raw-material, which the vegetable elaborates into substances adequate for its own restitution and propagation. These substances, thus prepared by the vegetable, furnish the raw-material further elaborated by the animal into substances adequate for its much more complex restitution. The essential relation obtaining between the vegetable and the animal is one of preparatory synthesis, commenced by the vegetable, and continued by the animal. The relation is not, as usually supposed, one of mutual compensation, of alternate deoxydising and reoxydising of compounds. The vegetable is not the hoarder, and the animal the spendthrift of our planet. The animal takes up the work of molecular elaboration slightly begun by the vegetable, takes up that slender thread of organic stuff spun by the yellow rays of the vivifying light, and weaves it into the magic fabric of world-revealing, world-conquering brain and muscle.

So much, at present, concerning the origin of the entoderm. Now it devolves upon us to find out how the chemical nexus, constituting vitality, gives rise to the principal structures of the ectoderm.

In stellate monera, in which the rays become so deeply deteriorated as to remain exteriorised and deadened till redeemed to life by direct combination with complemental material, in such inferior monera it is clear that preparation of restitutive material becomes a function of every ray, *i.e.*, of every portion of the moving substance. The substance of each ray melts under the influence of food, and composes with the same a nutritive corpuscle, which then yields the products that assist in the formation of new rays.

In the course of organic development the process of external and direct rehabilitation is gradually transformed into a process of internal and indirect rehabilitation. This progressive and momentous change, which I call the *intussusception* of nutrition, is clearly demonstrated in a series of different monera. The material prepared by one retracted ray through direct combination with food goes to restitute from inside the disintegrated material of another ray. Thus, one portion of the living substance comes to prepare the products for the immediate restitution of another portion, which latter portion is now, in consequence, enabled to assume exclusively the dynamical relations with the medium. In this manner a digesting part of the common protoplasm becomes subservient to a moving part, which fact means that the entoderm has simply to furnish the restitutive material for the ectoderm. By this ascendancy the

ectoderm has gained the power of carrying on unrestrictedly its dynamical play with the medium.

It will sound fantastic in the extreme, when I state that this simple truth concerning the supremacy of the ectoderm forms the groundwork of all moral and social abilities. I cannot at present pause to defend the position, but will only say that the study of nature cannot well reveal a more significant relation than the one here demonstrated as actually obtaining between entoderm and ectoderm. We know now for certain that a living being does not normally move, feel and think for the ultimate purpose of feeding; but it feeds, that by moving, feeling and thinking it may reach higher stages of development. Life means at its very rise the increase, refinement and unification of its correspondence with the dynamical powers of the universe.

In attentively watching all kinds of monera it becomes unmistakably evident that the main business of moneric life is to be found in the shattering of its ever-renewed projections against the disintegrating influences of the medium, or rather in the assiduous, never-flagging renovation of its shattered substance. The unceasing reiteration of this one action leaves no doubt that in its performance is embodied the chief purport of life. What then is the true meaning of this fundamental vital activity, and how does it accomplish ectodermic organisation?

Here, for once, I assume unproved (the nature of the case not admitting any ready proof), I assume that the disintegrating influences of the medium exert a gradually modifying, a specifically elaborating effect on the protoplasm. By splitting off from its substance a definite molecule, the dynamical forces will determine to some slight extent the result of its reintegration. The pre-established direction of its intrinsically organised affinities suffers some infinitesimal change through the molecular disturbance generated on each concussion. Instead of restoring with absolute precision its former integrity, the protoplasm incorporates a molecule slightly differing from the one it lost. Its complexity is thus increased by the well-known process of chemical substitution. Surely this is the laborious operation through which progressive changes force their entry into the living substance. By this process of superimposed increments of molecular elaboration, the functional disintegration of the active protoplasm gains the significance of functional evolution, the functioning material assuming truly the part of an evolutional substance.

We know that in plants organic compounds are built up by an analogous process. For elements split off by dynamical influences, there are substituted, by force of intrinsic affinities, other elements, which go to make up higher compounds than

those previously decomposed. Disintegration affords the stimulus upon which there ensues higher integration, by means of affinitive substitution.

In the laboratory organic compounds are likewise built up on this plan of gradual substitution.

The constructive power at work in this most essential process of molecular elaboration is clearly a power of indwelling chemical affinity, a power by which new elements are incorporated with a pre-existing molecule, so as to form with the same one single chemical unit.

Affinitive integration, the marvellously efficient and specific force by which the living substance is empowered to effect its own chemical saturation, to complete thereby its own structural integrity, and even to complicate the same by further developmental accretions, this acknowledged force openly and obviously displayed in every vital action constitutes, indeed, the true source of all living energy, the quickening spring that gives birth to all the enigmatical phenomena emerging from the mystic life-stream of fleeting existences.

Other current doctrines notwithstanding, this slowly elaborated power of complemental restitution to full integrity of a previously established most specific chemical unit is the true power that winds up the spring of life, that furnishes to the organism the vital resistance with which it is enabled effectively to encounter the disintegrating forces of the medium. The usual supposition that vital energy is derived from the re-oxydation of deoxydised food-ingredients, is on a par with that other supposition that makes the chick emerge from its shell a mere equivalent of the heat-waves that ministered to its incubation. Such notions only too obviously reveal how utterly our present science misapprehends the stupendous energies that are sustaining life.

To choose the most familiar instance in connexion with this question, the origin, namely, of muscular power, it is generally believed that on stimulation non-nitrogenous constituents of the muscular substance, or non-nitrogenous fuel directly derived from the blood, undergo oxydation, and that muscular contraction represents the mechanical equivalent of some of the heat evolved during the process. This conception, typical of the present state of vital dynamics, is erroneous in every respect. The fact is, that on stimulation a hyaline substance much higher in the chemical scale than myosine explodes. A non-nitrogenous molecule is thereby split off, seized by oxygen, and rapidly transformed into eliminable products. This process of oxydation and elimination is merely an accessory depurative performance, and does not essentially and directly enter into the actuation of

muscular contraction. The remaining muscular substance, a nitrogenous compound, somewhat of the constitution of myosine, contracts, because it forms part of the physical nature of this portion of the disintegrated muscular protoplasm to assume as near as feasible the globular shape. Thus far, some few physiologists, among whom Hermann is most conspicuous, have by laborious researches gained a true understanding of muscular activity. But now comes the point where utter darkness still prevails. The contraction of muscular substance represents thus a collapse from a high state of tension, a falling back into an inferior state of equilibrium. What power is it that winds up again the spring of action, that restores the potential energy expended in contraction, that replaces the muscle into its position of dynamical advantage? My protoplasmic studies give me the plainest possible answer to this fundamental question of vital dynamics. It is the mighty power of chemical renovation, by dint of which the protoplasm recovers from its state of contracted inability, and forces with renewed energy its way onward again into space. It is the functional restitution of the moving substance and its concomitant expansion that constitute the long-sought-for source of muscular power. Expansion furnishes the energy. Contraction expends it. Expansibility is the fundamental physical property of protoplasm, not contractility as universally believed. The pushing out of hyaline expanding material in course of chemical cumulation is visibly the life-spring of protoplasmic motility.

It is only fair to confess that chemical activity, with its definite selective preferences and its constructive origination of specific properties, is an ubiquitous energy at present completely beyond the reach of our scientific comprehension. Neither physical nor psychical interpretations have hitherto availed to throw any light on its mysterious nature. The various attempts at a mechanical explanation, *i.e.*, at a reduction of chemical laws to the simple laws of mass-motion, have not even succeeded in offering a plausible suggestion as a hypothetical basis to start from. And with regard to our modern hylozoism, inspired by Schopenhauer and becoming prevalent even among the scientific celebrities of our time, it can only be said that it plainly proves that we have once more exhausted the combinations all round. We are growing conscious that our earnest and most determined efforts to make motion produce sensation and volition have proved a failure, and now we want to rest a little in the opposite, much less laborious conjecture, and allow any kind of motion to start into existence, or at least to receive its specific direction from psychical resources; sensation and volition being for the purpose quietly insinuated into

the constitution of the ultimate moving particles. If, however, evolution is to be our scientific creed, we can expect the great and good things only after strength has been gradually gathered through endless toil.

Chemical elaboration then discloses itself as the secret activity of which the vital energies are concomitant manifestations. Of whatever ultimate incident chemical composition may be the perceptible symbol, to us it is the embodiment of a synthesis accompanied by the appearance of new properties, scientifically incalculable and unaccountable.

The properties of the molecule of water are even less intelligible to us than the properties of the living molecule. Of the former we possess only a mediate knowledge; of the latter, also some little immediate knowledge.

From point to point we are formulating the great truth that the centralised animal organism represents only one single monadic molecule.

When intussusception of nutrition is fairly established, when all food is at once drawn into the organism by the immediate shrinking of the digestive substance and the pushing forward of new evolutional substance, and when all restitution is internally effected by means of complemental material accurately prepared through chemical processes within the organism, then the more and more rapid restitution of the functionally disintegrated protoplasm becomes the very obvious sign of further evolutional progress. The fact cannot be misapprehended. The more quickly protoplasm, when overpowered by the dynamical influences, is capable of chemically recovering, the higher must that protoplasm be considered to stand in the scale of evolution. This growing power of rehabilitation can, of course, only be due to an advancing molecular elaboration of the living substance—an elaboration evincing itself functionally in a more effective resistance to the disintegrating influences.

The results of this chemical development can be observed at very many different stages in different monera. The more inferior the moneric protoplasm, the more deeply is the disintegrating effect seen to penetrate its outermost expanded region. The slower is then also the restitution, and the more extensive the shrinking which accompanies it. More time and more space are occupied by the chemical or functional oscillation of the living substance. This complex molecular process, with its concomitant manifestations, which composes the definite period from the moment of disintegration to the moment of complete reintegration, I call the *functional unit* of the living substance. The higher the living substance the smaller its functional unit, *i.e.*, the less profound its disintegration the less the time

requisite for its restitution, and the less the extent of its shrinking.

It is clear that the functional unit is nothing but the elementary vital activity of disintegration and reintegration now definitely regulated by means of the intussusception of nutrition. It represents the unimpeded immediate play between the organism and its dynamical medium, specific restoration of chemical equilibrium following in definite succession, in strict periodicity, specific disturbance of chemical equilibrium.

Now, let us suppose that, at the entire surface of such an ovoid moner as we have previously described, the power of resisting disintegration on the part of the living substance has grown so effective as to admit of no perceptible shrinking at any point; that just so quickly as the protoplasm is disintegrated, just so quickly will it also recover at the very spot—that in fact the chemical oscillations at the entire surface of the organism have at last become equivalent to the disintegrating dynamical pulses: when this stage of organic elaboration has been reached, then it is very evident there will occur no more shifting of protoplasmic masses at the parts thus equilibrated, or, which is the same thing, the surface will have gained the position and consistence of a permanent organic structure.

In the same way it can be watched almost stage for stage how, by the growing power of prompt restitution, deciduous projections are transformed into the permanent prehensile whip of protoplasmic units.

Where surface-equilibration has been established, the primary functional unit of the protoplasm, its surface-unit of disintegration and reintegration, which bears the first brunt in carrying on the immediate functional play with the medium, will restitute itself from the living substance just underneath it. The definite explosive shock of the primary functional unit, spreading to the adjacent material, will cause specific disintegration of the same. The next moment the affinitive restitutive force comes into play, and the complemental molecule required by the primary functional unit for its renovation will be readily abstracted from the deeper-seated disequilibrated material, which thereby will constitute a secondary functional unit. Thus the functional disturbance started at the surface will be propagated in definite pulses through a certain depth of protoplasm—a depth increasing with the progress of organisation, and involving at last the entire protoplasm down to the digesting substance. In this manner the intrinsic chemical flow of protoplasm becomes in the course of development definitely circumscribed, and functionally subdivided into a number of consecutive functional units. It is thus that the ectoderm, as a

permanent structure originates, living structures being maintained from moment to moment by chemical restitution.

In watching our ovoid moner we perceive that the nutritive corpuscles are embedded in a large mass of granular material, and that it is not this material which constitutes the really active portion of the protoplasm. The substance which more particularly exhibits the mass-effects of the molecular operations of the organism is seen to emerge from the granular matrix as a perfectly hyaline material. Products derived from the nutritive corpuscles go first to compose the granular matrix, and products derived from the granular matrix go then to compose the hyaline active substance. In some monera the evolution of the perfectly hyaline material from a matrix, growing by degrees finer and finer grained, can be directly witnessed, and there can remain no doubt that the protoplasm of a moneric projection is a continuously evolved substance increasing in chemical complexity the further it gets advanced from the region where food products are directly assimilated. The foremost and outermost portions of the projection, its apex and its circumference, are the chemically highest portions of the entire protoplasmic unit. The living substance is therefore not merely a vortex, but, moreover, a chemically cumulative vortex, and it is the internally culminating and externally most exposed region of the protoplasm which comes into immediate collision with the surrounding medium, experiencing therefrom functional derangement. I have on several occasions made use of the expression "centralised organism," confining more especially to this class of organisms the views here propounded. Our ovoid moner is a centralised moner in the sense here implied. Its hyaline substance does not protrude in manifold narrow projections, retracting again after exposure to the medium, and being followed by new projections at different places. On the contrary, it flows on interruptedly through space in one and the same direction. The entire organism may be looked upon as forming one single projection, through the apex of which a renewed flow of hyaline material is ever maintained. The chemical cycle forming the protoplasm of this centralised being is so balanced within itself, and in relation to the forces of the medium, as to constitute a single fluent activity, by which it moves, is shaped, and receives its sundry organic differentiations.

We see here demonstrated in a most obvious manner how the highest evolutional substance is always found foremost in space, and we feel that, with the understanding of this grand fact, we have penetrated one of the supreme secrets of vitality—that of head-domination. We know now that this headmost portion of the living substance represents primordially and con-

stitutionally the consummation of all the organic labour performed within the living individual, and that it is therefore intrinsically fit to enter into higher relations with the dynamical medium than any other portion.

Concerning the difficult problem of animal individuality, it may prove serviceable to remark that the inwardly restitutive protoplasmic projection, with its chemically cumulating substance, highest at the apex, next high at the circumference, and with its direct dependence on the digesting substance, constitutes in all reality the primitive zooid, the veritable animal unit. All essential divisions and directions of organisation are predetermined and foreshadowed in its molecular composition and activity. The entoderm and ectoderm, the longitudinal axis, with its cephalic and acephalic pole, the transverse axes, that remain equal when the animal does not creep but that get distinguished in size and import through the establishment of a dorso-central differentiation when the animal does creep,—all these fundamental tendencies of organisation are contained in the specific flow of the living substance, and are invariably expressed in the shape of a protoplasmic projection.

We observe that even a single mass of fluent protoplasm may constitutionally form a star with many rays—may virtually represent a multi-zooid being; whilst other masses of fluent protoplasm form but one single projection, and may on that account be called centralised units.

Further complications in animal individuality arise through generative multiplication. We see, for instance, the very complex organism of our Paramaecium divide, so as to give rise to two beings of exactly the same complex kind. The substance of two zooids thus formed, and not yet separated, may in other animal classes coalesce chemically, and also to a more or less extent morphologically. When completely unified in this manner, they constitute merely segments of a single individual, now in future directly reproducible through propagation. But beings formed by generative multiplication may remain morphologically connected to some slight extent without coalescing chemically, in which case the morphological aggregate will not be directly reproducible through propagation.

Generative multiplication may, however, also take place through budding from various parts of a parent organism. Here again the consecutive generations thus produced may coalesce so as to form part of a single unit, in which case the different zooids will lose their separate individuality, and become more and more modified so as to minister to the uses of the centralised organism. Or, on the other hand, many consecutive generations may remain morphologically connected, without any centralisa-

tion being effected. All these different modes of connexion between living units sometimes mingle in the organic world, and prepare a rather puzzling task for the morphologist. Add to this the phenomena of phylogenetic condensation, progressive metamorphosis, alternate generations, retrogressive metamorphosis, embryonic evolution, and we cannot wonder that so little progress has hitherto been made in the understanding of organisation and vitality.

The perplexities of this difficult subject will, however, to a great extent disappear, when biologists will have become convinced that the protoplasmic projection represents the primitive zooid, uncomplicated by morphological intricacies. Whether appearing as tentacle, or as appendage of any kind, as paramer or metamer, the protoplasmic projection or primitive zooid undergoes morphological subdivision only by specification of its molecularly coherent substance. Never is its structure successively put together by the aggregation of a multiplicity of autonomous living elements. Its integument becomes divided and subdivided into areas of specific stimulation, and correspondingly its contractile layer becomes divided into muscles and subdivided into muscular fibres. But never do separate units go to range themselves so as to fill up in due order an ideal space between two points that are thereby to become the cephalic and the acephalic pole, some of the units building up the integument, others the contractile layer, all working diversely towards one common purpose with which they are not incorporated, governed therein by laws extraneous to themselves.

The vagaries of this latter conception would be patent to everyone, if embryology did not seem to enforce exactly this view. But it must be remembered that embryology is merely *re*-productive evolution, and cannot possibly furnish an adequate standard for the understanding of productive evolution. Even embryology, however, in its demonstration of consecutive and continuous germinal layers gives confirmation to this new mode of viewing fundamental differentiation.

Besides we have almost direct proof of it. Some of the lowest worms are not much more advanced in the scale of organisation than certain ciliated infusoria. They are of about the same size, and without special preparation their integument and their contractile layer appear hardly less homogeneous than the corresponding structures of the infusoria. Now, on disruption of the integument by crushing, or on application of certain chemicals, the substance of the integument in these worms will become converted into a dense crowd of globules, which in some kinds are nucleated, in others not. The contrac-

tile layer, however, is not in the same way resolvable into units. Is it at all justifiable to look upon infusoria as morphological units, but to take the worms, on the contrary, for creatures whose equivalent structures have been put together by the aggregation of an astonishing number of autonomous elements? No reasonable defence can be found for such a position.

The ectoderm of the zooid is first differentiated into layers, and afterwards these layers are partitioned into subdivisions.

When in a being like our centralised ovoid moner surface-equilibration has been reached, when the functional unit has become synchronous with the dynamical unit, when the chemical surface-vibrations keep accurate time with the dynamical medium-vibrations, when the power of local resistance on the part of the living substance has become equivalent to the power of local disintegration on the part of the external agents, —then we have a structurally established organism. We have seen that in an organic unit of this kind the protoplasm constitutes a chemically cumulating substance, of which the outermost surface, *i.e.*, the most advanced part in space, forms the molecularly culminating layer. It is clear then that the functional units of this chemically highest surface-layer will be smaller than the functional units of deeper-seated layers. The former, therefore, will exhibit greater resistance to disintegration, more rapid recovery and less shrinking than the latter.

The dynamical influences affect only the primary functional unit, the surface-unit. Direct stimulation can extend no deeper. It is therefore the primary functional unit that controls all deeper-seated function. All functional activity can spread only from the surface of contact with the medium, and the rest of the protoplasm is thus entirely dependent for its functional stimulation on the activity displayed by the layer of protoplasm constituting the primary functional unit.

The functional units grow larger, display slower action and more shrinking, the more remotely their substratum is located from the surface, and the less advanced, in consequence, the stage of chemical elaboration which it represents.

Thus a functionally resisting substance at the surface becomes, by degrees, differentiated, and gains full control over the functionally yielding substance of the interior of the ectoderm.

The outermost layers of the highest product of molecular organisation, having become fully attuned and vibrating in accord with the dynamical influences of the medium, exert now complete and direct sway over the contracting layers of inferior protoplasm, with which functional continuity has been established. And, by their specific restitutive demand, they exert

also complete, but more indirect, sway over all other organic activities.

What then is the vitally essential property of this dynamically equilibrated, chemically highest, outermost region of the protoplasmic unit, which exerts functional control over the entire individual?

The answer is quite plain, indeed altogether unmistakable. The resisting substance is, and can be, in essence, only incipient nerve-tissue.

A spectator, witnessing through the medium of his senses the performance of the moving protoplasm sees it expand and contract. Were the same spectator endowed with sufficient power of vision he would, on watching the resisting substance, undoubtedly see it also expand and contract, only with exceedingly small and rapid beats. That is, in fact, all that an outsider can possibly behold of life: motions of protoplasm in definite directions, and more or less rapid.

But it is no less certain that some of these vital motions, perceptible, or, at least, representable by an outsider, correspond inwardly to an entirely different fact, experienced only by the moving protoplasm itself. The same occurrence which outwardly and mediately is perceived as motion by others, constitutes, under certain conditions, inwardly and immediately in the living substance a peculiar experience, called sensation.

It is reasonable to suspect that the condition under which evolutional function begins to correspond to something inwardly felt is not fulfilled until the organic beats have become fully attuned to the dynamic beats. But as the resisting substance is gradually developed from the shrinking substance, it can be readily conceived that sensibility itself must gradually arise from the unknown and unknowable state which inwardly corresponds to what we perceive as motor activity. In this light it can remain no longer surprising that we actually find motility and sensibility so intimately interblended in nature.

We have now reached a position, from which we can comprehend the conditions that have led to the formation of the various fundamental germinal layers, increasing in organic value in proportion as they approach the surface, and increasing still more in organic value in proportion as they approach the headmost region of the protoplasm.

The resisting protoplasm of the surface of the organism constitutes intrinsically a chemically graduated substance, of which each succeeding zone is different in quality from the one preceding it in position. Through more and more specialised attunement to the impulses impinging upon it, the continuous material of the layer at last divides, and then again subdivides

into a number of separate areas of specific stimulation. Thus a surface-mosaic of most definite sensorial elements is formed. The separateness of these external points of stimulation in the resisting substance involves ultimately a corresponding separateness of dependent stimulated partitions in the shrinking or contracting substance.

In the course of further organic development the stimulated effects realised in the separately corresponding elements of the attuned surface-mosaic will reach the hyaline evolutional substance. There, by a process of complex harmonisation, analogous to the one which took place at the surface, the composite value of the variously blended surface-stimulations will receive its structural realisation.

In ciliated infusoria the occurrence of this centralisation of surface-impressions can be inferred with much probability. For days I have watched the sharply circumscribed, coarsely granular nucleus of gigantic amœbæ, and have become almost convinced that it constitutes an organ of water- and oxygen-supply. For days also I have watched the constantly changing outline of the all but hyaline so-called nucleus of infusoria (Vorticellæ, Colpodæ, &c., &c.), and have become almost convinced that we have here before us the centrally-confined evolutional substance, the incipient nerve-centres.

However much the outside influences succeed in cleaving with their specialising stimulations into myriads of divers integral parts the *morphological* unity of the organism, the *chemical* unity in its affinitive range triumphs over every estrangement. Infringed upon in its expanse from all sides, the homogeneous substance becomes all the more completely elaborated, all the more subtly sensitive to every change. Perceiving the different influences of the medium in their most specialised form through the intervention of the fully harmonised functional units of securely isolated nervous substance, it is ready to reproduce with the vast totality of its own inhering power the generically accumulated and chemically organised significance of the sundry transient promptings of individual life.

The view of vital occurrences here lightly sketched has rendered clear many phenomena of life hitherto unintelligible. It has yet to stand its most trying test. We have seen how utterly other theories have failed consistently to account for the activities of growth and reproduction. The increase in bulk by the interposition of spontaneously constructed physiological units or plastidules, and the multiplication by division of overgrown masses thus constructed, are suppositions so palpably at variance with plain facts that only the blind logic of the

aggregational propensity could have led to them. Whoever has watched the division of highly differentiated infusoria with its exact duplication of every slightest detail of the complex organisation, ought to be aware that something very different from mere overgrowth is here conspicuously in operation. The upper half of the dividing animalcule has to reconstruct a lower half, and the lower half has to reconstruct an upper half. Evidently, the same influence is here normally at work that repairs an organism when by accident it has lost one of its halves; and growth itself can mean essentially nothing but repair or reconstruction of the generical type from some fraction of an individual.

I believe that the conception of life here maintained, the conception, namely, that the individual organism constitutes but one single chemical unit, will be found to afford an easy and scientifically legitimate explanation also of these most recondite phenomena of vitality.

Any portions of the unitary protoplasm of an organic individual, and especially its so-called germs, have to be considered in the strictest sense of the term, chemical *radicals*. You remove from a chemical compound a part of its integrant atoms; it is then no longer saturated, but represents a chemically disequilibrated residue with combining powers corresponding to the severed atoms. Whenever occasion offers the radical will become re-saturated; it will in fact restitute itself, will restore the integrity of the compound which it radically represents.

Surely it is this admitted chemical occurrence which underlies the vital phenomena of growth, repair and reproduction. In this light the fundamental activities of life can be conceived as one single consistent chemical action, functionally checked by outside influences. This play of intrinsic and extrinsic forces may be conveniently expressed in the following table :—

Functional restitution or resistance.	Functional disintegration or impressibility.
Correlative reconstitution or repair.	Correlative disorganisation or waste.
Generical equilibration of growth.	Generical disequilibration or seeding.

These are the very intelligible categories of vital activity. To contradistinguish the theory of organisation here briefly expounded from the prevailing Cell-theory I call it the Theory of Specification,—specification of one single protoplasmic unit into definite areas of disparate stimulation, not association of a number of elementary organisms for the purpose of dividing among themselves an hypostatised physiological labour.

V.

The triumph of the Cell-theory is mainly due to the conjunction of three very different circumstances. (1) The morphological appearances of embryology seem visibly to demonstrate that the entire organism is made up of nothing but successive generations of units derived by propagation from one single parent. (2) The independent vitality really and apparently displayed by morphological units when detached from their organic connexions gives a powerful support to the notion of their autonomous vitality. (3) The plausible application to such vital units of the laws evinced in the socio-political co-operation of individuals or persons ends by rendering the position of the cell-theory all but impregnable. Let us shortly consider the three points in order.

(1) Ontogenesis is only reproductive genesis. A minimal speck of material safely and quietly deposited in favourable environments reproduces in a few hours, days, or weeks what originally had taken ages upon ages of wide-spread struggle to accomplish. The ways of this intrinsic reproduction cannot by any possibility faithfully retrace the ways of the original development. The latter was most gradually impressed from outside into the molecular constitution of the living substance. The former is already adequately pre-established in the molecular constitution of the germ-cell. The germ-cell represents essentially the condensed result of accomplished development, not an initial stage in a development yet to be achieved. The unfolding of the germ is the reconstitution of organic effects already chemically secured, not the incidental securing of organic differentiations during evolutional progress. The multiplication or division of the germ-cell signifies therefore an entirely different process from the multiplication or division of unicellular organisms. In spite of the amœboid motions performed by germ-cells, there can exist in the whole range of organic nature no greater contrast than between a germ-cell that reproduces an entire complex organism and a genuine amœba that only reproduces its own kind. The application of the common term "cell" to both these organic units can only mean that the one is a protoplasmic body enclosing a second protoplasmic body, and the other is also a protoplasmic body enclosing a second protoplasmic body. The amœba represents a complete protoplasmic unit, generically fully equilibrated. The germ-cell represents a generically disequilibrated fragment of a protoplasmic unit.

It is asked, May not the higher organism owe its existence to the coalescence of a whole series of alternate generations? Any attempt to conceive the complex organism as an assemblage of alternate generations—each tissue with its structural elements representing the asexual multiplication of one of these alternate generations—must fail for the simple reason that the sexual reproduction of the series can then only take place from the generation highest in the scale of development. The germ-cell of vertebrates, for instance, would have to be derived from the most developed portion of their brain. How could it otherwise contain, for future reproduction, the developmental increment of brain-activity? We find, on the contrary, that material remotest from the brain, somewhere near the margin of direct intercommunication between ectoderm and entoderm furnishes the substance, the chemical radical, requisite for reproduction.

Embryology renders undoubtedly very essential services to biology, but it is by no means competent to assume the controlling influence in the formation of a theory of organisation.

Whoever has kept an incubating machine going is well aware how exceedingly perplexing the crowded appearances of embryological evolution prove to be. Even the most patient and skilful observer gets lost in the labyrinth of tangled forms. Considering the pretensions of embryology, it may seem rather surprising to outsiders that the embryological origin of even the principal structures of the ectoderm remains as yet altogether problematical. It is not definitively settled, it is not even approximately made out, which of all the possibilities is the one actually occurring in nature. Whether nervous and muscular elements represent each one single cell, or whether they represent each a number of coalesced cells, or whether they are somehow exuded or otherwise deposited during the chemical transformation of cellular protoplasm, or lastly whether they owe their existence to cells immigrating from other parts—these are all suppositions plausibly maintained and alternately recurring from time to time. It requires, indeed, much doctrinal faith to make oneself believe that the continuous stretch of protoplasm constituting the ectoderm represents any cells at all, that the exquisitely slender and elongated nerve-fibre and the comparatively enormous muscular element participate in the same cellular nature with the epithelium-cell or the blood-corpuscles.

(2) As regards the autonomous vitality of organic elements, the white blood-corpuscles have had chief stress laid on them. The white blood-corpuscles, of which all red blood-corpuscles are transformations, perform amœboid movements. What more striking proof of the separate vitality of each single cell could be found, than the display of motility on the part of its protoplasm? Nevertheless these movements are not vital movements, but merely the effect of a chemical metamorphosis of protoplasm. Young infusoria under unfavourable conditions are sometimes unable to maintain their surface-equilibration. They are then transformed into amœboid beings, the substance of which gradually declines in molecular constitution till, at last, all activity ceases. A white blood-corpuscle forms originally an integrant part of an organic tissue. It is then detached from this and left to attain chemical equilibration in a new and constantly changing medium. In some annelids the inner surface of the entoderm, the surface forming one of the walls of the perivisceral cavity, is seen during digestion to become densely crowded with large refractive granules. Irregular flakes composed of such granules held together by a viscid hyaline protoplasm detach themselves and float about in the perivisceral cavity, constituting primitive blood-corpuscles and displaying amœboid movements. This I have watched numbers of times.

The essential office of the blood-corpuscle is to elaborate restitutive material by means of its chemical interaction with the medium in which it floats. This interaction, however, cannot be considered vital, for the blood-corpuscle does not maintain its structural integrity. On the contrary, it is transformed from a lymph-corpuscle into a red blood-corpuscle, and, after having spent its store of chemical efficacy, is soon eliminated as effete matter. Its amœboid movements are not due to any vital play with the medium, but are simply movements accompanying its career of chemical transformation. In pus-corpuscles even the myeline-nature of the projections can be sometimes detected with the help of the polariscope. The most perfect movements of the kind that I ever witnessed were displayed by pus artificially derived from the epithelium of an eye macerated in serum for 48 hours at a temperature of 96° F.

This, I think, will be found to be the correct interpretation of one more

of the circumstances that have conspired to give the cell-theory its present predominance.

(3) How shall we now lastly dispose of the socio-political argument?[1] It is maintained, not only in a figurative sense, but quite seriously as a matter of fact, that the organism is a co-operative society of elementary individuals, and *vice versâ*, that human society is an organism. Much brilliant thought has been spent in the glorification of the supposed relations. But however tempting a little polemical skirmishing in this direction might be, I prefer, after all the weighty considerations that have been brought forward in proof of the molecular solidarity of the protoplasmic organism, to abstain from these more fanciful modes of argumentation.

Mental science is destined, I believe, to become the most powerful as well as the most positive of all sciences, for the simple reason that it is the only immediate and direct science, the only science in which the objective and the subjective aspects coincide, in which they corroborate each other, signifying for once one and the same fact. The peculiar motions of objects that form the subject-matter of other sciences are only signs for qualities roused by stimulation in the observer. There the motions observed in the object do not to our knowledge coincide with any subjective state concomitantly experienced by the object. Consequently these motions signify to us merely that we the spectators are affected in certain definite ways by an unknown process occurring outside of us. It is quite otherwise with mental states. Here the peculiar motions witnessed or inferred by the observer in the neural substratum are directly indicative of corresponding qualities inhering in the moving object. This complete equivalence of motion and sensation obtains nowhere in nature but in sentient foci, and may lead in the course of time to the construction of an exact science of qualitative values, whilst in our present sciences qualities are only very inadequately represented by quantitative symbols.

[1] Everyone has heard something about the celebrated discussion between Haeckel and Virchow concerning the teaching in schools of cellular physics, metaphysics, ethics, and politics. To an impartial judge, it must seem evident that Virchow took his punishment with the true spirit of a scientific and political martyr, faithful to the liberal professions of his youth. The veteran politician and veritable originator of the socio-political interpretation of cell-life knew right well that, if ever the Iron Chancellor became alive to the fact that his beau-ideal of a state was actually realised in nature as the most consummate of all her achievements, the vertebrate constituting an "admirable cell-monarchy" with "hereditary castes" and lower orders that execute promptly and without grumbling the dictates of their superiors, forthwith the inculcation of the tenets of the cell-theory would become the chief business of all the schools in the land till every person would cheerfully accept his alloted place in the social scale, and the humblest of them rejoice in time of peace or war to fill the office even of a blood-corpuscle.

At all events it is now very generally admitted that an accurate knowledge of the corporeal substratum of mind is indispensable to the precise interpretation of mental phenomena. And it is quite certain that we cannot understand the life of the nervous system without correctly establishing its relations to the rest of the organism, and its relations also to the universe at large. An adequate theory of organisation is an essential pre-requisite to psychology. A psychology that can be made to harmonise with the Aggregation-theory must differ *toto genere* from a psychology in harmony with the Specification-theory.

EDMUND MONTGOMERY.

III.—ANOTHER VIEW OF MR. SPENCER'S ETHICS.

MR. HERBERT SPENCER informs us in the preface to his *Data of Ethics* that the concluding part of his philosophical system, to which this volume serves as an introduction, is that for the sake of which all the rest was undertaken. And in fact the principles here enunciated are substantially identical with those set forth thirty years ago in the author's *Social Statics*, and repeatedly enforced in various essays published during that interval. Stated generally those principles may be described as an attempt to combine the standpoint of Bentham and his followers with the standpoint of Wilhelm von Humboldt, and both with the theory of an innate moral sense. We have now before us a further attempt to base the resulting system on the doctrine of Evolution considered as a whole. So comprehensive and conciliatory a scheme coming from so high an authority deserves to be examined with the closest attention. Mr. Spencer exercises a wider influence than any contemporary philosopher, his present theme is one of universal interest, and he views it in the light of a life's experience and meditation. Yet it may be questioned whether his ethical theory will command even as much acceptance now as when it was first propounded. It will not be surprising if those works which their author regards as merely subsidiary should really constitute his chief title to rank among the leaders of European thought, and if the end which he values so much more highly should be dismissed to the limbo of philosophical utopias. It would of course be unfair to judge of the new ethics until it has been laid before us in its entirety. I shall therefore refrain from discussing the author's very striking and original method of deducing rules of conduct immediately applicable to present circumstances from the idea of a perfect

social organism conceived as the necessary term of evolution; merely observing that to begin at the end seems a reversal of the mode of study usually followed by believers in development, and that the analogy of mathematical reasoning might equally be invoked in favour of any ethical code whatever. Fortunately the present volume is so planned that a large portion of it, touching on the fundamental problems of morality, may be discussed without reference to any ulterior instalments. I propose to offer some remarks on this portion, and in so doing it will be convenient to follow an order of exposition slightly different from that adopted by Mr. Spencer.

Every ethical system to be complete must directly or by implication give an answer to the four following questions; what is the highest end of action, or otherwise expressed, what is the absolute standard of right and wrong? then, how do we prove our answer, how convince others that our standard is the best? thirdly, from what motive do men act rightly? and lastly, by what means can the right end be attained? Sometimes the same answer might be given to two or even three of these fundamental questions, though never, I think, to all of them. For example, our own gratification might conceivably be named as the end, the verification and the motive of right conduct; or conscience might both reveal the law of duty and prompt us to obey it; or the very act of obedience might convince us that we were right. Logically however they are distinguishable, and great confusion often results from not keeping them apart. To the first demand Mr. Spencer's answer is clear and emphatic. Pleasure is the absolute end and all other things are valuable only as means to it. Even life would not be worth having without pleasure. Whose pleasure, whether mine or yours or theirs, must be determined subsequently. We proceed to ask, how do you know this, how do you prove your principle? The question had already presented itself to J. S. Mill who also adopted the hedonistic standard. According to him the proof of utilitarianism is that nothing is desirable but happiness, meaning by happiness pleasure and the absence of pain. But tastes differ; what seems desirable to one man may be undesirable to another; and if there is an absolute standard it must be the same for all. To prove that pleasure is alone desirable we had better show that as a matter of fact nothing else is or ever has been desired; that those who assert their preference for other ends are labouring under an illusion; that every object of pursuit not originally pleasure-giving has become so by association with pleasurable feelings. This is precisely the method chosen by Mr. Spencer. He appeals in support of his assertion to the recent controversy on the value of life. All mankind are divisible into pessimists and

optimists, and both parties, however radically opposed, "agree in one fundamental postulate. Both their arguments assume it to be self-evident that life is good or bad according as it does, or does not, bring a surplus of agreeable feeling. The pessimist says he condemns life because it results in more pain than pleasure. The optimist defends life in the belief that it brings more pleasure than pain" (p. 27). The inference being that by general agreement, implied if not expressed, life derives its whole value from the pleasurable feeling accompanying it. Here with all deference I must observe that Mr. Spencer is doubly if not trebly mistaken. In the first place, although Schopenhauer and his school are hedonists, it is perfectly possible to be a pessimist without thinking that pleasure is the end of life and that we do not get enough of it. Some persons if they were convinced that certain knowledge was unattainable, even if they expected it to yield them no pleasure, might regard that as a reason for preferring nonexistence to existence. In the second place, as it is generally better if possible to meet your adversary on his own ground, an optimist who believes that life affords a surplus of pleasurable feeling may very well advance that argument without conceding that such a surplus alone makes life worth having. And, thirdly, as a matter of fact the optimists do not make this concession. M. Caro, an eminent representative of the spiritualistic school in France, has distinctly declared that granting the excess of pain over pleasure to be possible and even probable, he still remains an optimist, that even an unhappy life is worth living, and that suffering is preferable to nonentity.[1]

A fortiori would such persons maintain that a perfectly neutral state of consciousness, a life totally devoid both of pleasure and pain, is worth having. Thus the appeal to authority completely breaks down, a single recusant being enough to invalidate it. Nor does it help the argument much to ask, as Mr. Spencer does, whether this and that virtue would still be looked on as virtues did their practice produce pain instead of pleasure, or contrariwise whether certain vices would still retain the name if their effects were reversed. For the question is not whether pleasure is a good and pain an evil, but whether pleasure is the only good and pain the only evil. An attempt to reduce various other standards to the hedonistic standard is vitiated throughout by the assumption, so far unproved, that life and pleasure are interchangeable terms; while, with a great want of philosophic calmness, opinions at variance with the author's are attributed to a survival of devil-worship and other savage superstitions. What-

[1] "La vie même malheureuse vaut la peine d'être vécue et la souffrance vaut mieux que le néant."—*Revue des Deux Mondes*, Dec. 1, 1877, p. 507.

ever may be the genesis of moral beliefs, to cast imputations on an opponent's ancestry is more characteristic of barbarous than of civilised controversy. In discussions like the present appeals to universal agreement are of little avail, as the disputant whom they are supposed to confute must by hypothesis furnish in his own person an exception to the general rule. Apparently no attempt has been made to study the strongest and most recent writers on the contrary side. Every argument adduced by Mr. Spencer must be perfectly familiar to Professor T. H. Green and yet have failed to convince that eminent dialectician. To declare pleasure a necessary form of moral intuition[1] must in the present state of the controversy be pronounced a piece of unwarrantable dogmatism.

There is however a more powerful method of demonstration in reserve. If the conditions of life in its fullest, most enduring manifestations are such as to make pleasure a necessary cause, accompaniment, and consequence of volition and sentiency; if those individuals and communities who make pleasure their supreme end are the fittest to survive; in a word, if evolution is on the side of the hedonists; and if it can be shown that every contradictory hypothesis is inextricably bound up with beliefs peculiar to an imperfect form of civilisation; then utilitarianism will be freed from the necessity of answering objectors by their gradual elimination in the struggle for existence. But before considering whether this or a somewhat different result follows from an unbiassed application of the new scientific method, let us first glance at the attitude assumed by our author towards the utilitarian school. While recognising the superiority of that school over its predecessors, he is careful to distinguish his own doctrine which is rational from that of the old utilitarians which is empirical. He agrees with them in judging actions by their results; but according to him they fail to show why some classes of actions necessarily produce happiness and others misery, and his aim is to supply the deficiency. He compares their empirical generalisations to the observations by which ancient astronomers were enabled to predict the position of the heavenly bodies with an approach to accuracy before Newton came and by discovering the law of gravitation showed that those bodies must occupy certain places at certain times. The analogy is not very fortunate, for, granting hedonism to be true, ethical science has already found its Newton in David Hume. The great Scotch philosopher set up a principle which comprehended and explained all partial moral laws just as universal gravitation explained Kepler's laws

[1] P. 46. Observe the confused use of terms. On Mr. Spencer's own showing pleasure is a kind of feeling, and feeling is matter, not form.

and the Copernican system. He showed that certain courses of action were prescribed because they were socially useful; and taking the recognised virtues in order he showed how they corresponded to such utilities. Others have followed since then and have explained perturbations in the rules by variations in the standard. There is still plenty of room for scientific discovery in tracing the process by which each utility came to be recognised as more than merely individual, and perhaps also in devising an improved machinery for its attainment; but so long as hedonism keeps the field Hume's general method seems unlikely to be superseded. Further explanations appear to indicate that Mr. Spencer would have every class of actions judged by its tendency to raise or lower the aggregate life of the community. He supposes the case of a man who is either wounded or starved or badly paid or robbed or calumniated or otherwise ill-treated, and shows without difficulty that his power of maintaining life is thereby directly or indirectly diminished.[1] But no instance of a necessary connexion between antecedent and consequent is here exhibited which Bentham or any other old-fashioned utilitarian would not have been equally able to detect. The only difference seems to be that Bentham would have taken into account not only the loss of health and life but also the pain inflicted as an element in the various classes of wrong-doing; whereas the new scientific morality makes conduciveness to life the supreme standard of rightness, and this after telling us that life is only valuable on account of the pleasure it yields. Perhaps however the object is to show why some actions cause pleasure and others pain. If so it must be observed that such investigations, interesting as they may be, belong not to ethics but to physiology or psychology. For every purpose of the moralist it is enough to know what kinds of action cause pleasure and pain without stopping to ask why they possess that property, any more than an architect need trouble himself about the cause of gravity and cohesion. I have already attempted to indicate in what direction a true scientific basis for utilitarian ethics may be sought, and the materials furnished by Mr. Spencer will enable us to ascertain how far such a support is really supplied.

To understand the behaviour known as good or bad we must begin by viewing it as part of a larger whole, that is of conduct in general. Conduct comprehends all adjustment of acts to ends from the simplest to the most complex. Again human conduct is part of animal conduct which must be studied by tracing its antecedents, in other words by considering it as a product of

[1] Pp. 58-60.

evolution. On comparing lower with higher animals and savage with civilised men, we find that the latter are respectively distinguished from the former by a more complete adjustment of means to ends securing a richer or a longer life or both together for individuals, and a more careful nurture for their offspring. The most perfect adjustment of all is attained when members of associated groups and the groups themselves as wholes instead of encroaching on each other, co-operate for the achievement of a common end. This is only possible in peaceful societies and only in them can evolution attain its limit. "Ethics has for its subject-matter that form which universal conduct assumes during the last stages of evolution." Good conduct is that by which men attain to the completest life. The view here unfolded is confirmed by an examination of the various senses in which the words 'good' and 'bad' are commonly used. Things and actions are classed under either head according as they do or do not attain the purpose which we expect them to subserve. A man's conduct is called good when it tends to self-preservation. Parents are accounted good who carefully attend to their children's health while preparing them for the requirements of adult life. Still more emphatically is the term applied to those who help their fellow-men to live; while in all three cases bad is used to designate conduct tending in the contrary direction (pp. 1-26). In connexion with these facts I may observe that moralists of every school are far more agreed on the necessity of maintaining life than on the absolute desirability of pleasure. Even the philosophical pessimists never make away either with themselves or with their neighbours, and inculcate a morality not unlike that of their optimist opponents. Life is in fact the means to all other ends and must be secured before they can be pursued, as must also be the means to life itself. Were this truth steadily borne in mind much less alarm would be felt about the theoretical stability of morals. Another reflection suggested by the foregoing analysis is that while moral conduct has this in common with animal activity that it is adjusted to ends and that it contributes to life-maintenance, it is distinguished from all other activity by profoundly characteristic differences corresponding to those that divide a person from a thing. It is indeed only by a somewhat equivocal use of terms that purely animal activities can be spoken of as having an end at all. Where we find a series of functions moving round in a perpetual circle it is a false abstraction to pick out one of them and call it an end, or to speak of the whole circle as an end and of each link as a means. Ends only exist in and for the reason by which they are constituted. Moral conduct must be conscious, its consequences must be foreseen, and they must interest others besides

the agent. When a man takes care of his health his conduct is not moral unless we admit that his life is held in trust for beings outside himself. All the higher animals care for their young; human beings alone bring up children to reproduce and reflect their own personal existence. And the limit of morality seems to be reached, not when the greatest possible sum of animal life has been obtained, but when a permanent reciprocity of personal relations has been established. Abstinence from aggression and rendering of mutual assistance are doubtless conducive to longer life, but their principal value lies in the spirit they reveal. Moral conduct cannot be explained by the mechanical theory of evolution until the consciousness of personality has been first explained as a rearrangement of matter and motion, or as an aggregation of feeling determined by an integration of nervous processes. In fact, moral conduct is a part of reason, differing from vital actions not only in degree but in kind. It preserves life, but only because life is an indispensable means to the attainment of every other end. Thus we are again brought round to the question, what is the value of life? And we have to consider what light is thrown on it by evolution. Mr. Spencer holds that advancing life tends to increase the proportion of pleasurable sentiency. His argument is as follows:—

"If we substitute for the word Pleasure the equivalent phrase—a feeling which we seek to bring into consciousness and retain there; and if we substitute for the word pain the equivalent phrase—a feeling which we seek to get out of consciousness and to keep out; we see at once that, if the states of consciousness which a creature endeavours to maintain are the correlatives of injurious actions, and if the states of consciousness which it endeavours to expel are the correlatives of beneficial actions, it must quickly disappear through persistence in the injurious and avoidance of the beneficial. . . . . At the very outset, life is maintained by persistence in acts which conduce to it, and desistance from acts which impede it; and whenever sentiency makes its appearance as an accompaniment, its forms must be such that in the one case the produced feeling is of a kind that will be sought—pleasure, and in the other case is of a kind that will be shunned—pain" (p. 79).

There is a certain ambiguity about the words 'accompaniment' and 'correlative' here applied to sentiency. The nervous process causing any beneficial act, as for instance swallowing, may on the subjective side be a pleasurable sensation, and so understood the two would clearly be correlatives. On the other hand, it might conceivably be accompanied by a neutral state of consciousness or by none at all. Pleasurable sensations would then be located in a particular part of the nervous system which would be so connected with the centres presiding over deglutition as to be brought into play simultaneously with them and to excite other actions tending to their support. The same

reasoning will apply to the connexion between injurious actions and pains, only that here the reaction would be inhibitory. I write under correction, but it seems to me that the second alternative is the more probable. Acts usually accompanied by pleasurable or painful feeling are owing to various causes occasionally performed unconsciously, which looks as if the nervous process causing them was itself indifferent, although in ordinary circumstances it awakens the activity of another centre inseparably associated with intense sentiency. But if so much be granted, it seems clear that the nervous connexions leading to beneficial actions might become so firmly established as to need no assistance from the pleasure-producing processes which might then fall into disuse and perish from inanition. Pleasure or at any rate the molecular movement underlying pleasurable feeling involves a very appreciable expenditure of force, as may be seen from the exhaustion consequent on intense enjoyment and quite out of proportion to the muscular effort expended in procuring it. Accordingly those whose lives can be maintained without its assistance will have a great advantage over others who remain dependent on it for the performance of life-subserving actions. This hypothesis will explain why evolution after going on for so many ages has left us with such a moderate sum of enjoyments, and why that sum should be greater with children than with grown-up people. It also throws some light on the mischievous effect of indulgence in stimulants and narcotics. The pleasure they give is too dearly purchased by consumption of energy. Mr. Spencer has adduced numerous instances to prove that pleasure as such is good for the health, and so it may very well be, especially when taken in moderate doses, by heightening the energy of the nervous processes without being a necessary accompaniment of healthful function.

It may be observed that hedonism and evolution are so far if not at cross purposes at least playing different games. Hedonism only values life for the pleasure it yields; evolution only values pleasure for the life it subserves. As we have seen, there is reason to believe that if life could be preserved at less expense the boon would be withdrawn; and there is no reason to believe that such an important saving in the vital economy will not be made hereafter. If owing to improved physiological and social arrangements pain should simultaneously disappear, sentiency will be fixed at the zero point. Half the hedonists' prayer would be heard, but the other half would be dispersed in empty air. Human beings would not, like George Eliot's unhappy inventors, be displaced by self-propagating steam-engines, but they would themselves have become as passionless as any machine. We appealed to evolution and this is the answer that we get. What

more natural than that a machine or something like one should be the ultimate outcome of mechanical laws?

We have now to consider what answer Mr. Spencer gives to the third fundamental question of ethics, that which relates to the motives of moral conduct, the impulses to right action. His whole chapter on the Psychological View may be regarded as an attempt to deal with this problem from the evolutionary standpoint. Assuming that conduct is right according as it tends to secure the most pleasurable existence for self and others, and observing that conduct departs more or less widely from this standard whether we compare together different men at the same time, or the same man with himself at different times, or societies in different stages of civilisation, we have to discover the causes of their variation.

Conduct, according to Mr. Spencer, is never free but is exclusively determined by motives. Motives consist of mental presentations or representations combined with pleasurable or painful feelings. They are most simple with the lowest animals and become more complex as evolution proceeds. The primary impulse of self-preservation cannot always be followed with safety. Experience shows that the actions it prompts are under certain conditions attended by painful consequences. Thus when the actions are mentally pictured as a preliminary to their performance they call up a representation of the attendant pains which acts as a deterrent. The association becomes embodied in nervous structures and is transmitted to the animal's offspring, a process secured by the survival of the fittest, as those individuals in whom it has not been effected will perish through their want of foresight without leaving progeny behind. As mind goes on becoming more complex a hierarchy of motives is established, the simpler being generally less authoritative than the more compound and ideal, that is, those into which the representation of remoter consequences enters as an element. Generally but not always; for disregard of the primary impulse may be self-defeating, as when a mother absorbed in maternal duties neglects her health so much as to become incapacitated for their discharge. Here the author seems for once to have understated his case. When two motives conflict action must ultimately be determined by another motive more abstract than either of them, a fact well expressed by the saying 'It is not true that second thoughts are best but third'. Self-regarding virtue is easily explained by the foregoing analysis. A prudent man abstains from immediate gratification or submits to immediate pain, that he may secure a greater pleasure, or escape from a greater pain hereafter; he learns by experience to estimate the relative values of pleasures and pains, as well as to recognise the conditions on which they

depend; his self-control and sagacity give him a great advantage in the battle of life, and the results of his empirical generalisations may be transmitted as intuitive judgments to his descendants. Conduct affecting others is to a certain extent controlled by the same class of motives. Impulses prompting aggressive acts are held in check by four distinct restraints of a prudential character; fear of retaliation from the injured person or his friends; fear of legal punishment; fear of divine vengeance; fear of public opinion; while conversely beneficial actions are prompted by the hope of gratitude and reward. The last three sanctions go on evolving with the evolution of society which in their turn they powerfully aid.

With regard to the religious sanction a few words must be said in passing. Mr. Spencer holds that theological belief originated not, as all rationalists used to suppose, with the personification of physical forces, but with the ghost-theory, that is the belief that every man has a double continuing to exist after his death, capable of injuring the living and of being propitiated by sacrifices. The commands of a powerful chief originally issued for the purpose of maintaining discipline by forbidding aggressions that lead to quarrels would continue to be obeyed after his death through dread of his ghost. Political injunctions are enforced by fear of the living, religious injunctions by fear of the dead. It seems a pity to disturb such an ingenious and symmetrical theory, but I am not aware that it is supported by any external evidence, while there are strong reasons for dissenting from it. Modern inquiries into the history of jural conceptions show that among primitive men kings were not legislators but judges, and not so much judges as arbitrators freely chosen by the contending parties to mediate between them, but without power to enforce a reference of the case to their own decision. From a number of isolated judgments was formed a general law, and at a still later period of civilisation all the laws then current were consolidated into a code the authorship of which was sometimes attributed to a god. If the god were derived from a ghost, his origin and the enactments of the person whose ghost he was must by that time have passed into complete oblivion. The original judgments or Themistes as the Greeks called them were looked on as being supernaturally inspired,[1] no doubt a strong way of expressing the popular belief in their infallible rectitude; and this circumstance coupled with the fact of their being given at the request of the parties concerned seems to prove that from the beginning right was not based on authority, but conversely authority on a

[1] See Maine's *Ancient Law*, pp. 4 and 5, 7th ed.

sense of right; for it was precisely to decide which was right that both parties called in an arbitrator. Mr. Spencer is very severe on those who talk as if it was being prohibited that made an action wrong. But probably no one really thinks this. People look on the prohibition not as a cause but as a proof of wrongness. Moreover they have a well-grounded though confused feeling that actions must be classified before their morality can be determined. As a utilitarian would say, they must be judged by their general consequences. The legislator having done this once for all has saved others the trouble of doing it. Thus the popular trust in authority supplies a salutary correction to the equally popular intuitionism or rather sentimentalism which would pronounce on each particular case according to the dictates of personal sympathies and antipathies often of a very frivolous character. Another objection to Mr. Spencer's account of the religious sanction is that the gods of a progressive people, originally conceived as indifferent to the moral conduct of human beings, are afterwards brought into relation with it. Homer's deities take sides from purely personal motives without regard to the merits or demerits of Greek or Trojan. But on passing over some centuries we find Zeus and Apollo, as represented by the Delphic oracle and the Æschylean drama, possessed of very lofty moral attributes, inflicting heavy penalties on the murderer, the robber, the seducer; punishing an evil intention as much as an overt act. Evidently they had been moralised just like human governors by a constant appeal to their arbitration and protection.

Passing from the origin of religious restraints to their essential character, it is surely unfair to speak as if this consisted solely or chiefly in the expectation of rewards and punishments. So far as the conduct of a truly religious man is influenced by his faith, it is not through the fear, but through the love of God. Nor do I mean simply that he obeys the moral law for God's sake, as he might perform some otherwise disagreeable task at the desire of a beloved friend; but I mean that, through the intermediation of God, through the consciousness of a divine nature permeating all humanity, other men are brought so near and, as men, are made so dear that for him wilfully to injure them would be like a denial of his own existence. He feels that this divine presence is essentially one with the unity of his own personal consciousness, and with the unity in distinction between himself and the objective world. This fundamental synthesis, whether we choose to give it a theological interpretation or not, everywhere constitutes the limit of inquiry and the condition of intelligence in metaphysics, in psychology, but most clearly in ethics; and the impossibility

of expelling it from thought is proved by the inevitable incoherencies and self-contradictions of those who would dispense with or deny it. Whether and how far this observation applies to Mr. Spencer will perhaps appear on continuing the exposition of his principles a little further.

The three orders of restraints—political, religious and social—above specified are not properly called moral: their deterring effect is due to an extrinsic artificial consequence of the immoral act, not to its intrinsic natural consequence, which is a mental representation of the injury inflicted. Nevertheless, we are informed that the highest or purely moral restraints are evolved from the others, as well as that they come into existence at a later period. We have now to ascertain how the evolution is accomplished. This transition from enlightened self-interest to dutifulness, involving, if necessary, a sacrifice of self, is the most important point in the whole system, and, in order to avoid the possibility of misconception, it will be advisable to quote Mr. Spencer's own words.

"The restraints properly distinguished as moral are unlike these restraints out of which they evolve, and with which they are long confounded, in this—they refer not to the extrinsic effects of actions but to their intrinsic effects. The truly moral deterrent from murder is not constituted by a representation of hanging as a consequence, or by a representation of tortures in hell as a consequence, or by a representation of the horror and hatred excited in fellow-men; but by a representation of the necessary natural results—the infliction of death agony on the victim, the destruction of all his possibilities of happiness, the entailed sufferings to his belongings. Neither the thought of imprisonment, nor of divine anger, nor of social disgrace, is that which constitutes the moral check on theft; but the thought of injury to the person robbed, joined with a vague consciousness of the general evils caused by disregard of proprietary rights. . . . . Conversely, the man who is moved by a moral feeling to help another in difficulty, does not picture to himself any reward here or hereafter; but pictures only the better condition he is trying to bring about. . . . Throughout, then, the moral motive differs from the motives it is associated with in this, that, instead of being constituted by representation of incidental, collateral, non-necessary consequences of acts, it is constituted by representations of consequences which the acts naturally produce. These representations are not all distinct, though some of such are usually present; but they form an assemblage of indistinct representations accumulated by experience of the results of like acts in the life of the individual, superposed on a still more indistinct but voluminous consciousness due to the inherited effects of such experiences in progenitors: forming a feeling that is at once massive and vague." (Pp. 120-1.)

Experience teaches us the consequences of our actions (let me observe, in passing, that the powerful effect of education is quite ignored), and the representations, or, in common parlance, the knowledge of them prompts us to refrain from the bad, and to perform the good. But how can an experience of intrinsic

consequences be evolved out of an experience of incidental consequences? According to the laws of association, it is just the contrary effect that ought to be produced. When the idea of a robbery habitually brings up the idea of imprisonment, there will be less room for the idea of the loss suffered by the person robbed to present itself in. The whole current of thought has been turned in a different direction; its course can only be changed by blocking up the old channel, and excavating a new one. Penal sanctions must be suspended before ethical sanctions can come into play. It was precisely when rich and educated Athenians had succeeded, by the exercise of rhetorical skill, in turning the dikasteries into instruments of robbery and murder, when they had ceased to believe that the gods existed, or believed that their forgiveness could be purchased, and when public opinion had been corrupted into a worship of success, that Plato came and filled up the void by a moral doctrine more disinterested than any taught before. Mr. Spencer seems to have felt some difficulty about the matter, for in the very next paragraph he uses phrases with an altogether different meaning. The moral feeling and correlative restraints have "disentangled themselves" from the feelings and restraints due to authority. These latter have maintained the conditions under which they evolve.[1] With the aid of penal sanctions, a stable community is produced, and in this community (remarkably enough) experience is accumulated of the painful effects caused by aggressions sufficient to "generate that moral aversion to them constituted by consciousness of their intrinsically evil results". But how comes this particular consciousness to constitute an aversion? This, the most vital question of all, is left unanswered. Yet the savage who puts an enemy to death by slow torture not only understands what he is doing but rejoices over it, knows that he is inflicting pain and inflicts it because he knows it. So with all injurious actions (and there are many of them) where the injury produced is direct and manifest: it must have been mentally represented before the crime was committed, and yet did not operate as a restraint. Further on, we learn that moral feelings are pre-eminently associated with indirect, remote, and general consequences (p. 122). That is only true when the good or evil caused is indirect, remote, and general, and then it is only persons of reflective habits who bring any moral feelings into play on the subject. Moreover, as knowledge of these ulterior consequences goes on extending, all the penal sanctions are made more stringent, so that in this respect nothing remains to differentiate them from the purely moral restraints.

[1] In a previous passage, penal restraints are spoken of as "controls within which the moral control evolves".

But the most important objection of all to Mr. Spencer's derivation is that, if the direct effects of our actions, as represented in imagination, have no influence on the will until they become associated with some feeling, neither can the indirect. Zero can never be increased by fractions or multiples of itself. I have assumed that the co-operation of an associated feeling is required, for Mr. Spencer's whole psychology assumes it. The feeling must also, so far as I can gather, be either pleasurable or painful. Why should such a feeling be aroused by vague ideal representations rather than by vivid concrete images? And what brings it into connexion with either class? And, even granting that ideal feelings of pleasure or pain are excited in the manner described, why should the motives so constituted be considered more moral than any other? A man, let us suppose, is tempted to commit murder. The idea of his proposed victim's death brings up the idea of being hanged himself, which causes a painful feeling, checking the meditated action. The restraint is immoral. If, on the other hand, instead of thinking about the gallows, his mind runs on the bad consequences attending this murder in particular and all murders generally, and if this train of reflection brings up painful emotions, causing him to desist from his project, that is a moral restraint. I cannot see how one is more moral than the other. In both cases the man abstains from an aggression, and is so far commendable. In both cases he is actuated by the desire to get rid of a painful feeling, and is so far absolutely selfish. Nor can I admit that the restraint is in one case an extrinsic, in the other an intrinsic consequence of the represented action. The necessary consequences of murder figure in both chains alike, for it is just on account of those consequences that murder is punished with death; but that those consequences should directly call up painful feelings in one man's mind is fully as artificial, as non-necesssary, as incidental an effect, as that they should call up painful feeling through the intervention of an imaginary gallows in the other man's mind. There is this difference that, in the latter case, we find a longer chain of causes; consequently the painful feeling to which it leads up must by the theory constitute not a less but a more moral restraint.

Passing over all these accumulated difficulties, we must ask once more—How come the represented effects of an action to be pleasurable or painful to me when the real effects concern others and not myself? Through the whole of a very elaborate analysis I cannot find any hint at an answer. There is some vague talk about the "pleasures and pains which the moral sentiments originate" (p. 131). But what *is* a moral sentiment if not a representation combined with a pleasure or a pain, and what else

do we want to act as "incentives or deterrents"? Sympathy, or the feeling produced by witnessing the expression of another's feeling, has been held by some to furnish a sufficient explanation of morality. This theory is, however, not put forward in the *Data of Ethics*, with reason as I think; for sympathy would be too fluctuating a foundation for duty, liable as it is to be expelled from consciousness by any strong self-regarding desire, besides which it has the disadvantage of only being aroused by feelings capable of very vivid representation.[1] According to another theory, acts involving injury or benefit to others come to be associated with pain or pleasure to ourselves from having been first associated with real or imaginary punishments or rewards. The connecting link may drop out, but the association remains indissolubly fixed. Disinterested virtue would then be an illusion, although, no doubt, a very useful one. Before the required connexion could be established in consciousness, we must suppose that a long succession of generations have been committing crimes and suffering penalties—an unlikely hypothesis, seeing that any family so disposed would incur speedy extinction; or that the good man's ancestors have been constantly brooding over sinister designs, but have lacked courage to carry them out. Their cowardice would have been inherited together with their caution, and we should be accustomed more generally than experience warrants, to dissociate courage from truthfulness, honesty and self-control. Mr. Spencer does indeed ascribe the sense of duty or moral obligation in part to an individual or inherited experience of external restraints, but only in part; for he assigns a large share to the superior authoritativeness of highly complex as compared with simple feelings. 'Never trust your first impulse,' said Talleyrand, 'for it is most likely to be a good one.' An evolutionary moralist distrusts it for the contrary reason. But I doubt very much whether the thought of remote consequences weighs more with anybody because they are remote. We submit to present privation for the sake of future indulgence, not because the latter is prospective, but because it can be had on no other terms, and will be great enough to repay our abnegation. So that if this latter element be eliminated, the

[1] "Supposing all thought of rewards and punishments, immediate or remote, to be left out of consideration, any one who hesitates to inflict a pain because of the vivid representation of the pain which crime produces in him, is restrained not by any sense of obligation, nor by any formulated doctrine of utility, but by an association established in his consciousness." —*Principles of Psychology*, vol. ii., p. 620. I do not know whether this passage is to be taken as excluding sympathies from the class of truly moral principles or not. I have not been able to make out any other passage in Mr. Spencer's writings that bears on the subject.

sense of obligation will be exclusively constituted by dread of punishment. Consistently with his own high standard of rectitude, Mr. Spencer believes that, as the true moral motive emerges into greater distinctness, it will tend more and more to dispense with the feeling of coercion, and virtuous actions will be performed entirely for their own sake. Thus the real nature and derivation of the moral motive, properly so called, remains as much a mystery as ever.

How comes it that so clear and powerful a thinker should have nothing better to offer on a subject which has engaged his attention for upwards of thirty years than such imperfect, confused and mutually contradictory conceptions? The cause must, I think, be partly sought in his attempt to reconcile intuitionism and utilitarianism without pausing to consider whether the truth was necessarily divided between them. How the reconciliation is supposed to have been effected will be seen from the following passage quoted by the author himself from his celebrated letter to J. S. Mill on the subject:—

"Corresponding to the fundamental propositions of a developed Moral Science, there have been, and still are, developing in the race, certain fundamental moral intuitions; and though these moral intuitions are the results of accumulated experiences of utility, gradually organised and inherited, they have come to be quite independent of conscious experience. . . . I believe that the experiences of utility organised and consolidated through all past generations of the human race, have been producing corresponding nervous modifications, which, by continued transmission and accumulation, have become in us certain faculties of moral intuition—certain emotions responding to right and wrong conduct, which have no apparent basis in the individual experiences of utility." . . . To which it is added that "the doctrine of innate powers of moral perception becomes congruous with the utilitarian doctrine when it is seen that preferences and aversions are rendered organic by inheritance of the effects of pleasurable and painful experiences in progenitors". (Pp. 123-4.)

It is not very easy to understand what is exactly meant by innate powers of moral perception, or by faculties which are also emotions. Let us suppose that unwillingness to injure others is implied by these terms. If the unwillingness arises from a consciousness of the pain inflicted on others, why have recourse to inherited experience when a single experiment is enough to produce it? If an obscure reverberation of the pain felt by a man's ancestors when they were robbed is meant, how can you prove, first that such a feeling was ever transmitted, and secondly that it would act as a restraint when the positions are exactly reversed, when the robbery brings gain instead of loss? But, be this as it may, the intuitionalists will probably decline to be reconciled out of existence, and will continue to maintain that the consciousness of moral obligation has nothing to do with what experience tells about the general consequences of actions.

Utility is not their standard, pleasure is not their motive. They hold that rightness and wrongness are intrinsic qualities of actions which on being perceived become motives to perform or to abstain from them. They believe that man is composed of two natures, a higher and a lower, each having satisfactions totally incommensurable with those of the other, our chief business in life being to develop the higher nature and to keep the lower from interfering with its activity; and without pretending that such a development necessarily adds to our pleasures or diminishes our pains, nay even while inclining to the opposite conviction, they still maintain that it is at whatever cost to be made the supreme rule of conduct. I am not defending their doctrine, nor do I see how it can consistently make a duty of contributing to the happiness of others, any more than hedonism can inculcate self-sacrifice; but I recognise in its affirmation of duty as a purely disinterested motive an important principle having nothing in common with the experiences of utility inherited, or otherwise acquired, into which Mr. Spencer analyses it. Utilitarianism greatly simplifies the ethical problem by reducing all the virtues to one, but in so doing it lets fall, sometimes even denies, the felt element of moral obligation attached by intuitionism to the performance of each separate duty. By a psychological sleight-of-hand one may substitute an estimation of consequences for the moral motive which intuitionism had previously supplied; nevertheless no ingenuity can make a perception of causal relations do duty for an impelling sentiment, any more than feeling can discharge the office of analytical deduction. Nor has utilitarianism anything to gain from an appeal to alleged intuitions which are useless if they coincide with conscious experience, and might be dangerous if they differed from it.

A critic is not bound to put anything in place of the theory whose validity he disputes, but when he has formed a positive opinion on the subject under discussion a statement of it may not be considered irrelevant. It appears to me then that moral obligation is essentially a product of reason. There is a twofold generality implied by its form. We think of it as a command prescribing or prohibiting a certain class of actions to a certain class of persons. But the actions must be of a kind interesting the whole class, and the command must give expression to their common will. Each individual is completely autonomous, he is morally bound by his own will and by that alone. Considered abstractedly as a unit in the community, his will is to repel every injury with which it is threatened.[1] Long before the time has

[1] The question what constitutes an injury is reserved. I am not satisfied with the utilitarian explanation, but have none of my own to offer in place of it.

arrived for him to take an active part in life he has learned by language, literature and express teaching to think of the group to which he belongs under an abstract conception which makes its homogeneity more evident, of the injuries threatening it under abstract conceptions which aggravate by generalising their danger. Thus the laws made by society in self-defence have beforehand enlisted his full approval, and he would be ready to re-enact them were they repealed. Each new aggression reawakens the accumulated odium of past misdeeds. Each new victim presented in varying circumstances helps by essential similarities to bring out more distinctly the type of a common calamity with which all can sympathise. Should such a man be afterwards tempted to commit a crime, his practised reason would immediately classify it as such, and the moral restraint is this, that the law forbidding crime exists within as well as without him, having become by repeated adhesions the expression of his own will; in violating it he violates his personal continuity so that his former self, the higher, the social, the disinterested self, rises up against him as his accuser and his judge. Conversely, if it is a virtuous act needing self-sacrifice to perform, his resolution is strengthened by the habit of applauding such acts when they were reported to him as the achievements of others for whose efforts he was accustomed in imagination to substitute his own. Briefly, our principles are formed when we are personally disinterested but abstractedly interested as members of a class; they are put in practice when we become interested in the former capacity while remaining relatively disinterested in the latter. If conscience arises from sympathy it is not from sympathy with the possible sufferings caused by our misconduct, nor yet with the disinterested spectator imagined by Adam Smith, but from sympathy with our own former selves and with their sympathy for others.

It remains to point out as concisely as may be how the felt obligations of truthfulness and chastity can be explained in accordance with the principle here suggested. Where these two virtues are accepted as such on utilitarian grounds, no separate explanation is needed. It has to be shown why their imperativeness should be recognised apart from any external sanction by those who do not accept the greatest-happiness-theory. Well, I think that if we regard moral obligation as a logical compulsion, a desire to be consistent with ourselves, then truthfulness instead of presenting a difficulty will strongly confirm us in our opinion; for it is an agreement of words with thoughts just as righteousness is an agreement of actions with ideas. More than this, it is closely connected with class-fellowship, for a falsehood directly weakens the tie between two persons while confidence tends to

strengthen it. With regard to chastity under the form of conjugal fidelity, it is the observance of a contract, those who break it being significantly called untrue or unfaithful to their partners. When unmarried persons alone are concerned, the obligation is, I apprehend, held to be primarily binding on women and indirectly through them on men. The reason of this distinction is that women are immediately, if not ultimately, more interested in monogamy than men are; their status can only be maintained at a high level by the assurance of life-long companionship and protection. Therefore anyone who surrenders herself on cheaper terms breaks a tacit contract made with the whole sex, who visit her treason with the only punishment in their power to inflict, namely, social excommunication.[1] But the fallen woman herself has assented to this law, and so the agony of Goethe's Gretchen is intensified by remembering that in the days of her innocence she had been as merciless to others as others will now be to her.

A further illustration of the general view here sketched is afforded by the various methods employed to deaden and destroy an inconvenient sense of moral obligation. Habitual criminals with whom the feeling is extinct, if indeed it ever existed, acknowledge no community of interest between themselves and others. They stand altogether outside the class for whose benefit laws are made. Offenders of a milder type allege that they have been unfairly treated, that society has not done its duty towards them; reciprocity of obligation is not observed. Others again argue that all men are each in his own way equally bad; the law-maintaining, law-protected class of our assumption does not exist. Or else the incriminated action is asserted not to be rightly classed, it does not belong to the kind of injury to which it bears such an unfortunate resemblance; or the class itself is not injurious; or the misdeed has been isolated by secrecy so completely as not to count for one; a crow, according to these reasoners, not being so black when you take it out of the rookery. Or, finally, the delinquent pleads strong passion as an excuse, thus admitting that he is not a rational being; with the chain of true personal continuity the chain of obligation snaps.

This account of the moral sentiment differs from that given by Mr. Spencer in preserving the idea of law which in his theory has, I think, been far too much neglected, while on the other hand much too large a space is allotted to the idea of causation. The tracing of remote and diffused consequences seems less likely to call up a crowd of emotional associations than rapid assimilation with other acts of the same kind round which such associa-

[1] Even habitual deference to men and preference of male society on the part of a woman is often fiercely resented by other women as derogatory to feminine dignity.

tions have thickly gathered. And while we cannot think of the purest morality except under the form of a law, so neither can we conceive positive laws, political, religious, or social, as existing without a moral element. They have penal sanctions, it is true, but their strength is due in great part to the voluntary adhesion of those whose conduct they control, acquired by a recognition of their intrinsic rightness. Here also the subject is a potential legislator. The supreme authority whether represented by king or god or public opinion, must after all emanate from the crowd and symbolise its essential unity. Inverting a well-known proverb we may say, *vox Dei vox populi*. We shall also understand more clearly how morality could be evolved out of positive law if we consider it as presenting in a conscious and generalised form something which had been present all along, latent and unconscious under a figurative disguise. External authority also served to define with ever increasing distinctness those classes of persons and actions which, as we have seen, are involved in the idea of moral obligation. Laws react on a community and bind its members more closely together. As certain offences were found by experience to be more dangerous than others they were visited with heavier penalties, and all who could not think for themselves were taught in this manner if in no other to regard them with greater horror. Thus the results of experience were stored up far more effectually in the consolidated traditions of the social organism than in the nervous systems of individuals, where their existence, as must be remembered, is still of an absolutely hypothetical and very problematical character.

We now come to the last ethical question, how can the right end be attained? To all utilitarian moralists this must be a most complex and difficult investigation. For besides the immediate production of happiness there is involved the discussion of two other problems, how to estimate the relative values of different pleasures and pains, and how to decide what share of happiness is due to each person. Mr. Spencer is not responsible for this arrangement of what may be called the economical aspect of ethics, answering roughly to the three heads of accumulation, distribution and exchange under which political economists distribute their subject; but it offers a convenient conspectus of the topics to which nearly half his volume is devoted and which may be expected to occupy a still larger space in the forthcoming parts of his entire work. Adequately to discuss his treatment of the various questions mooted would require a separate review; moreover, not much additional light would be thrown on the relation between ethics and evolution with which we are chiefly interested here. Room can only be found for a rapid indication

of the general argument and of what in my opinion are its most questionable points.

Utilitarianism as expounded by J. S. Mill teaches that in dividing happiness between himself and others, each individual ought to be perfectly impartial, deciding only on the grounds which would influence a disinterested and benevolent spectator. And according to Bentham the greatest happiness of the greatest number ought to be the object of pursuit. Now the happiness of a single person vanishes in comparison with that of the whole aggregate. From these premisses Mr. Spencer concludes that the theory so interpreted is pure altruism. What he means by altruism is not altogether clear. It is first defined as "all action which in the normal course of things benefits others instead of benefiting self" (p. 201). Now, first of all, I submit that words ending in 'ism' never denote actions but always beliefs or dispositions. Altruism would then mean the feeling that prompts us to benefit others instead of ourselves, which is not quite the same thing. A further difficulty arises when we find the author at a later stage of his argument using the expression "altruistic pleasure," which ought consistently to mean pleasure benefiting others. However we discover immediately afterwards that it is generated by the pleasure of others, is in fact pleasure at their being pleased or sympathy. Here then is something which is at once altruistic and directly beneficial to ourselves while not necessarily beneficial to others. Nor does the matter end here. Sympathy subsequently becomes a "higher egoistic satisfaction" (p. 243), then again "altruistic satisfaction," then something necessarily remaining "in a transfigured sense egoistic"; "as being part of the consciousness of one who experiences it," but "not consciously egoistic" (p. 250). Finally, we hear that under existing conditions altruism is understood to mean only "self-sacrifice, or at any rate a mode of action which, while it brings some pleasure, has an accompaniment of self-surrender that is not pleasurable" (p. 255). Taking this last definition as the clearest, I venture to say that neither Bentham nor Mill ever inculcated self-sacrifice as the invariable rule of conduct, and that no such injunction can be deduced from their principles. The 'greatest happiness of the greatest number' does not necessarily mean general happiness, but the greatest quantity of felicity whether divided among few or many. Of course, when one has had his fill the total amount can only be increased by a multiplication of happy individuals, but if we have only a limited quantity at our disposal we may *cæteris paribus* give it all to one or divide it in any imaginable proportion among the mass. Mr. Spencer has shown with perhaps unnecessary elaborateness that to give up the means of happi-

ness altogether would destroy life and, if made a universal practice, put an end to the existence of society; and also that some kinds of pleasure lose their value by being parted with. The inference should be, not that Bentham talked nonsense, but that he did not entertain the absurdity attributed to him. Obviously, the utilitarians mean that I should give up my own happiness when by so doing I can increase the general fund, but not otherwise. I am not bound to give up the fruits of my labour if by so doing I should encourage improvidence and idleness. But if it can be shown that the contribution of a small sum by each taxpayer to defray the expenses of public museums, galleries, libraries and schools produces more pleasure than it takes away, such a redistribution seems quite consistent with the principle of making pleasure the ultimate end of right conduct. When Bentham desired 'everybody to count for one, nobody for more than one,' he simply meant that nobody had a right to keep or to acquire happiness except it could be shown that his possession of it increased or did not diminish the whole existing quantity. Just in so far as self-sacrifice increases the total sum of enjoyment, to that extent is it inculcated by Bentham's school; and to the same extent Mr. Spencer would appear to be an altruist himself.

When it is asked how the material means of happiness should be distributed among a number of individuals, utilitarianism can give no general answer. A perfectly equal division would obviously create more pleasure than any other that could be fixed on without a knowledge of particular necessities that no government is ever likely to possess. To this course there are, however, two insuperable objections. Of these, the first has long been a familiar argument against socialism. Few men will do their best unless they are paid in proportion to the work performed; many men will not work at all unless they are compelled by the fear of starvation. The second has been impressed upon us by Mr. Darwin's teaching. Competition, by favouring the most capable individuals, tends to raise the general level of humanity, which would probably remain stationary, or, rather, would fall back, were all to possess equal facilities for living and propagating the species. Unfortunately our industrial and social conditions, as at present constituted, do not necessarily secure the survival of the fittest. A man may be much better qualified to earn money than to spend it with advantage to himself; or want of education may prevent him from attaining a position where his natural abilities would be turned to the best account; or the inheritance of a large fortune may relieve him from the necessity of doing any useful work whatever. On the other hand, even heavy taxation, instead of discouraging,

may stimulate the desire to produce, and a corresponding expenditure by the State for purposes of general utility need not foster idleness or improvidence. It is the duty of a wise government, so far as possible, to see that the best qualified persons are selected for the most remunerative employments, and also to diminish the sufferings while developing the usefulness of those whose poverty is their misfortune and not their fault. These are sufficiently trite propositions; but they show that a disciple of Bentham may consistently refuse to be either driven into an impossible altruism, or into an acceptance of what Mr. Spencer calls equity, which is the liberty of each bounded only by the equal liberty of all, liberty being interpreted to mean (not here but elsewhere) immunity, not only from restraint, but also from all taxation, except what is required for its own defence.

But is altruism itself so impossible and suicidal as is here maintained? We have seen that the definitions offered of it and of its derivative altruistic are neither very intelligible nor very consistent. The opposite term egoism has not been defined at all, although there is a whole chapter in defence of the activities which apparently it is understood to designate. These, so far as can be made out, are all activities useful to myself. Everyone will agree with Mr. Spencer that we must live before we can act. But never before, that I know of, has keeping oneself alive and well been called egoism. It is easy enough to show that if altruism means neglect of self-preservation, and if it were practised by all, humanity would speedily become extinct. But the altruistic precept, 'Live for others,' might alone have sufficed to rebut such an assumption. We are not told to die for others, although that, too, may be occasionally advisable; we are to *live* for them. And this shows how important it was to observe that the word by its very form denoted a mental quality instead of a class of actions. Not he who keeps himself alive is an egoist, but he who cherishes his life that he may devote it to self-indulgence. So altruism must mean the disposition to make the good of others our ultimate end, and to value our energies solely as means to that end. At the same time, while continuing to be altruists, we may very well accept benefits from others, and accept them all the more gladly as a proof of disinterested kindness. In a society where division of labour exists, nearly all the work men do is done for others; altruism would convert this outward fact into an inward sentiment, and while recognising payment as an indispensable condition would not allow it to be the motive of our activity. Mr. Spencer argues at length that if there is a difficulty in deciding what constitutes the greatest happiness for ourselves, a far more insuperable difficulty must be experienced in solving the same

problem for another. That might be true enough if we all stood at the same level to begin with; but the few who can choose their own lives must find that to raise the condition of those about them is practically a much simpler affair than to discover which of the competing enjoyments that solicit them on every side will contribute most to their own selfish gratification.

It appears then, on the whole, that Mr. Spencer leaves the great ethical problems no nearer to a settlement than he found them. He has not brought forward any new arguments in favour of the utilitarian theory, nor answered any of the criticisms which have hitherto been directed against it. Nor do his own strictures on the method followed by other utilitarian moralists seem to be founded on any sufficient reason. He has not satisfactorily analysed the sense of moral obligations, still less shown how it could be generated from lower modes of consciousness. In adopting intuitionism he lets fall precisely those elements which alone enable it to retain a hold on thinking minds. And, at a time when the compatibility even of Mill's doctrine of liberty with utilitarian principles is becoming extremely doubtful, he revives the much more extreme views of the last century, and vainly strives to deduce them from a theory which might as well be invoked on behalf of the most unmitigated despotism that any continental socialist has ever recommended to mankind.

With regard to the connexion between the conscious energy which we call morality and the series of unconscious transformations which we call evolution, there is this much to be said that both are favourable to life and happiness. And of this much we may be certain that no form of felt obligation at war with our permanent good can retain an everlasting hold on our allegiance. Many such obligations have existed in past time; some may be existing still; but all are destined to disappear. Nevertheless, obligation itself will last so long as there are rational beings on this earth, for it springs from the consciousness of our personal identity made intelligible only when reflected in other personalities like and equal to, while differing from, our own. Thus morality is a factor in evolution, and tends towards the same ultimate goal, but evolution alone cannot explain it, for its foundations are laid beneath the ebb and flow of things. It is a part of that eternal synthesis by which we gather up the whole universe from all infinitudes of time and space into oneness with itself and with ourselves, the absolute reality which is more knowable than any isolated phenomenon whatever, since only through it are knowledge and action made possible to man.

Alfred W. Benn.

IV.—BOTANICAL CLASSIFICATION.

A PRIME distinction in Botany, as also in Zoology, is that between a Natural and an Artificial system of Classification; but exception may be taken to the way in which it is commonly expressed. "In artificial methods," we are told, "one or two organs are selected in an arbitrary manner, and they are taken as the means of forming classes and orders; while in the natural method plants are grouped according to their alliance in all their important characters." It is further said, that "in giving the characters of any division, we notice merely those which are necessary to distinguish it from others". Now this is objectionable in at least three respects. In the first place, it sets up *importance* as the test or standard, but gives us no test or standard of importance itself. Next, it brings a too strong accusation against the artificial methods of *arbitrary* selection; thereby forgetting that the two systems differ simply in degree and not in kind. Last of all, it confounds between the ideal of the natural method and the botanist's actual achievement; between diagnostic and exhaustive characters—the one sufficient for an Analytical Key or Index, the other indispensable for a natural classification.

It is not, however, with the way in which the above distinction is usually expressed that we are now most concerned. We are more particularly interested in the botanist's practice than in his precept, and what we wish to see is how far he has successfully carried out the laws of classification in his science, and where and in what respects he has failed.

The basis of all Classification is Generality. It is generality that distinguishes a Genus from a Species; and generality, in like manner, distinguishes a Natural Order from a Genus, and a Class from a Natural Order. In Natural History classing we commence with a very wide sweep, and then proceed to narrow by degrees; each successive narrowing constituting a distinct resting-place or grade. The classes themselves, however, in their relations one to another (and similarly the orders and genera) are ungraded: in this respect, they are of coordinate value and do not proceed by the steps of the Porphyrian ladder; higher and lower are words inapplicable to them, and in a Table they would best be placed abreast, or represented by a horizontal line. Nevertheless, orders of distinct classes, or genera of distinct orders, or even different sub-classes or classes have points of community and resemblance: and this constitutes a main difficulty in the formation and location of grades, and necessitates (as we shall see presently) a variety of devices for marking and

presenting the affinities of groups otherwise disjoined and separate.

Now in true logical classing, three things are indispensable:—(1) There must be at least one particular in which all the included members of a group agree—in other words, a class-mark; (2) this class-mark shall not be trivial but essential, which in practice very much amounts to this—that it shall afford us a comprehensive and instructive grouping; and (3) everything that possesses the class-mark shall be included in the group, while everything shall be excluded that is without it. A botanical classification formed on these principles would give us the pure Logical Type. But, unfortunately, a botanical classification formed exclusively on these principles does not attain the Natural ideal, and, when we come to Nature, we must be prepared to strike a compromise. The *second* rule alone (that which has reference to the comprehensive and instructive grouping) seems susceptible of a pretty rigorous application; and it is the difference between a greater and a less attention to it that really constitutes the distinction between a natural and an artificial system, as at present worked. The difficulties in the way are such as these:—Plants appear that have all the characters—say of Dicotyledons, save the one of possessing two cotyledons. The very defining mark is infringed. What then shall be done? Shall we form a separate class of these, or shall they still be reckoned dicotyledons? By accepting them as dicotyledons a certain confusion arises: we extend the denotation of that term at the expense of its connotation; we never can be sure, in any particular instance, simply from the class-name, whether we have here a perfect dicotyledon or not; we are never safe, short of actual inspection. But, on the other hand, to make separate groups of the exceptions, would be to frustrate the very end of a natural classification; it would fail to display the natural affinities or co-relations of plants. And so, a further rule has to be enunciated—one that limits and, where need is, overrides the others. We must classify according to the number and fixity of characters; we must bring together into separate groups the members that display the greatest number of persistent resemblances. This, of course, supposes that we have collected for comparison the particulars to be arranged, and also that we pay a due regard to the differences as well as to the agreements.

Now in the application of this principle, two errors have to be carefully guarded against: first, confining our attention to one *class* of characters, instead of extending it to all; next, confounding between *observed facts* and *our explanations* of them. These caveats are far from being unnecessary. The evils arising from

disregard of the first of them will be abundantly exemplified in the sequel: an instance of the second may be found in Roots, as divided by Richards. Exception is sometimes taken to using this division in classification on the ground that endorhizal roots are adventitious. But the explanation here is one thing, and the circumstance is quite another that endorhizal germination is characteristic of endogens: and for classifying purposes the main question is, not "How do you explain it?" but, "What is the fact? Have we constancy or permanence here, and to what extent?"

From these remarks on the classifying process, it is evident that the arts of Description must play an important part in Botany, as well as simple classification. Indeed, the system of grading would be comparatively useless unless at each step we be presented with a full display of the characteristics applicable at that stage, and unless also we have there and then a note made of the exceptions. It is here also that we ought to have distinctly marked what we may call the *erratic* affinities of the grade, its points of contact with others from which in the schematic form it is necessarily separated, and a note of the palæontological and other facts that go to make up the real predication in the matter. Thus, we take the Gymnosperms. These form a Class or Division, according as we view it, by themselves. The first thing to do is, to indicate their class character, with the exceptions. This done, there comes next the geographical, geological, medical and other information—the *real* predicate: on which should be expended as much care as the mineralogists display in the handling of the corresponding field in their department. Then would follow the general relations of Gymnosperms to the other Classes—to Dicotyledons, to Monocotyledons, and to Cryptogams. This might either assume the form of a general note, or it might take the shape of a detailed examination of the order Gnetaceæ, which in so many ways is a *transition* order, and which (more particularly in its genus Welwitschia) shews points of resemblance all round.

Now our contention with the current classifications is that these requisites and laws are but very imperfectly attended to, and that in consequence the science of Botany is devoid of that logical form of which it is otherwise susceptible. It is the aim of a natural classification so to arrange the groups as to display at a glance the natural alliances. Instead of this, there are dislocations and mal-arrangements in the current systems so great as in measure to obscure the alliances. Again, the ideal scheme is that which affords us on perusal a thorough and complete knowledge of any particular plant—which so exhausts the characters and facts at each resting-place as that by collecting the

various descriptions we end by knowing all that is at present known about the individual in question. But nowhere do we find the characters and facts at all points exhausted, or even approximately exhausted; so that, however diligently we search, we cannot gather from works on Botany (not even excepting monographs) the full information we desire. Once more, botanical descriptions are often of the meagrest kind, and injustice is done to lucidity by ignoring the best devices of the descriptive art, and by the failure to keep in separation the "analytic" part of the presentation from the part that is a veritable predicate. These points will become clearer as we proceed.

I.—We shall commence with the obscuring of the affinities by malformation of grades and mal-location.

It might be supposed that, Grades being the very backbone of classification, there would be practical, if not absolute, unanimity among botanists as to the boundary lines. We should *a priori* expect that a law would be laid down regulating with some degree of exactness the amount of resemblance necessary to constitute (say) an Order, and the amount sufficient for a Genus. We might suppose that any great uncertainty in this respect would vitiate the whole process; and what we desiderate is something like an allocation on a numerical or quantitative basis. Now, making all due allowance for the difficulties, and not wishing to be more exacting in the matter than the circumstances authorise, we do think that much more may be accomplished in this direction than has ever yet been achieved. The individual classifier is left too much to the freedom of his own will, to the guidance of his own *taste;* he has been too indulgently allowed to take shelter under the wing of "importance," without being required to define more particularly what constitutes importance; and too little stress is laid on the necessity of *exhausting* the characters—of having them as numerically complete as possible.

We may begin exemplifying from the higher divisions. A good example is found in the heterogeneous collection usually assembled under the name of Monochlamydeæ or Apetalæ, and constituting the fourth sub-class of Dicotyledons; the other sub-classes being Thalamifloræ, Calycifloræ, Corollifloræ. It is tabulated thus, *e.g.*, in Balfour's class-book of Botany:—

Sub-class IV.—Monochlamydeæ or Apetalæ { 1. Angiospermæ. { *a.* Spermogens. *b.* Sporogens. 2. Gymnospermæ.

Now the objections here are the following:—The classifying-mark is manifestly ill-chosen; it does not naturally afford us a grouping that is both comprehensive and instructive, and the

result is—a most promiscuous collection, containing not only Monochlamydeæ but Achlamydeæ (thereby combining contradictories—a rather difficult feat!). The sub-divisions are founded on the distinction of covered and coverless ovule (*Angio*sperms and *Gymno*sperms), as though there were no angiosperms except such as are either monochlamydeous or achlamydeous. The group of sporogens is in the highest degree anomalous, as the very name indicates; and standing where it does we have the perpetration of a double Irish bull. It is from one point of view a group of sporous sperms, and from another point of view a group of acotyledonous dicotyledons.

Let us see then how and to what extent these faults may be remedied. In pure Logic, the groups require to be mutually exclusive. But we cannot insist on this rule with absolute strictness, otherwise we may lose the prime object of a natural system. There need not, however, be the amount of overlapping, or (to speak botanically) *imbrication*, that is here disclosed; neither need the anomalies be so numerous or so great. For take the above section of Sporogens (Lindley's Rhizantheæ), including Rafflesiaceæ, Cytinaceæ, and Balanophoraceæ,—and compare their characters with those of Dicotyledons in general; and it will be seen that their affinities are (to say the least) most disputable. The general characters of Dicotyledons are these:—Two cotyledons, exorhizal germination, exogenous growth, wood in a continuous ring, reticulated venation, quaternary or quinary symmetry. Tried by these tests, the Sporogens are found to be very deficient. In many of the particulars they are at variance (as, *e.g.*, in their spore-like seeds, in their acotyledonism, in the mode of formation of their endosperm); in others (such as their symmetry) they are at partial agreement; in others still, where the affinity is unquestionable, deductions have to be made from the fact when we come to consider *amount* or *degree*. So that, even on general grounds, their position is seen to be unsuitable; and the unsuitability is still further apparent when we descend to particulars, and view them in their setting. For let us compare them with the Spermogens, with which they stand bracketed, and with the Gymnosperms immediately below them: and how do they fare? They share with Spermogens the property of being monochlamydeous; they are also angiosperms: but these two characteristics are not very significant. The connotation of the first is at the best exceedingly trifling, and that of the second (which *might* be very great) is reduced to a minimum by the considerations already adduced. Much more is implied in the differences. They have spore-like seed, with a thalloid development; they are acotyledonous; they are stemless and leafless plants, wholly parasitic in their habits.

Weigh the diversities, and it will be found that they considerably overbalance the agreements.

It is even more difficult to see what near affinities they have with the Gymnosperms. These last form in many particulars a direct contrast. They have naked ovules, they are often polycotyledonous, their embryogeny is thoroughly characteristic, they have peculiarities in their stem tissues, they are achlamydeous, their venation is parallel (occasionally forked, rarely wanting), and altogether they are marked off by so many and such differences that to bring the two into close contact (as above) is to transgress all laws of right arrangement.

Either of two things then must be done. Either the Sporogens must be removed from the graded system altogether, and treated as a group apart; or they must be handled on the plan of double entry. This last seems the preferable of the two. It would give abundant opportunity of displaying their mixed affinities, and it would serve best to bring out the full extent of their anomalous character.

But what now of the Gymnosperms themselves? Is there any propriety in classing them as above, or ought not they too to have a more independent position than is here assigned them? The first thing that strikes us is, that they are achlamydeous, and therefore have a place among the Monochlamydeæ only by courtesy. We next observe that their companion groups are most unfortunately selected; their proximity serving only to obscure the resemblances. But the point of greatest interest and importance is their relations to the Dicotyledons. The affinities here are no doubt strong and numerous. Cotyledonism, exorhizal germination, exogenous growth, wood in continuous rings, distinct bark: these agreements imply a great deal. But not less striking, and even more suggestive, are the differences. These may be arranged under three heads. They are, first, morphological and structural—such as have reference to the root, stem, leaves, &c.; next, physiological, more particularly those connected with the embryogeny—where the affinity to the higher Cryptogams is so conspicuous; and, last of all, geological—where we have the moment of their appearance in time. The geological evidence speaks for itself. The testimony of the rocks points clearly in the direction of a distinct separation for the gymnosperms. But so does the testimony of the other branches. If we turn to morphology and function, we should have to consider such facts as these:—No true root-cap, neither a true epidermis at the root-tip, mode of formation of tissue in certain respects unique, foliage and flowers uniformly distinguished by their simplicity, peculiar structure of the fruit: above all, we should have to note the embryology and embryogeny, especially in the following particu-

lars :—ovule naked, one-coated (with such and such exceptions); endosperm formed in embryo-sac previously to fertilisation, and embryonal vesicles after fertilisation; several embryos formed in each nucleus, and polyembryony the typical condition; polycotyledonism frequent. To this we should have to add the remarkable features connected with pollination, and the cell-division of the pollen-grain. Now, these peculiarities are numerous and pronounced; and in estimating their value we must not allow ourselves to be drawn off by proffered explanations,—as when we are told that the polycotyledonism is owing to chorisis. Even granting the explanation (which many will refuse to do), the fact remains: it is a peculiarity of gymnosperms, not found in any of the other classes.

Taking then all these things into consideration, we see that the Gymnosperms require a position of great independence. It is not too much to say that they stand on the same level with Dicotyledons and Monocotyledons, and if a class-separation is needed for the one, nothing less will serve for the other.

But now having created a *Class* of Gymnosperms, where shall we locate them? Shall they be placed first of all the Phanerogams, or next the Dicotyledons, or intermediate between the Monocotyledons and the Cryptogams? The maximum affinity, as quantitatively determined, distinctly says the last. The geological evidence is wholly in favour of this, and to this the physiological evidence points as well. We have the proof in the peculiarities already specified; and weight also attaches to the logical consideration that by this means we give an adequate separation to contradictories,—all the phanerogamous angiosperms being brought together and placed in immediate contact *here*, and all the gymnosperms being placed together *there*.

There remain of Group IV. only the Spermogens. The affinities and the differences here are plain enough: and they are clearly such as to necessitate a distinct separation of the section from the other sub-classes. But the defining mark is highly unsuitable, and ought to be replaced by one less arbitrary and more expressive; and the group itself requires a full and careful subdividing.

Passing from the Class-grades, we may next exemplify from the Orders. A testing case is the Convolvulaceæ. In current classifications, it is the habit to rank with these the Dodders (Cuscutaceæ), and to make the one a Genus or at most a Sub-order of the other. Now let us work the agreements and the differences, with a view to quantitative determination, and see how it stands. The descriptive characters of the Convolvulaceæ are these :—Plants usually twining (sinistrorse); *leaves* alternate, exstipulate; *flowers* regular, with cymose inflorescence; *calyx*

5-cleft, polysepalous; *corolla* campanulate, plaited in bud, gamopetalous; *stamens* 5, alternating with the corolline lobes; *ovary* 2-4-celled, with 1-2 ovules in each cell; *styles* simple, often divided at top, 2 in number; *capsule* 2-4-celled, rarely 1-celled, septifragal; *seeds* large, with mucilaginous albumen; *embryo* curved, with 2 crumpled thin cotyledons. Now compare with these the Cuscutaceæ. They too are twining plants, with 4-5 cleft polysepalous calyx, and gamopetalous corolla; they have 4-5 stamens, and a 2-celled ovary with 2 ovules in each cavity: but their habit is in every way peculiar. They germinate in the soil and afterwards become parasitic: there is no primary root in the Cuscuta and no root-cap. They have a thread-like leafless stem (a fact which has considerable significance); their calyx is coloured like the corolla; *flowers* in clusters, with corolla nearly globular, and small scales alternating with the corolline lobes; *styles* either 2 or wanting; *fruit* either capsular or succulent, with fleshy albumen; *embryo* spiral, filiform, acotyledonous. Surely if a quantitative distinction holds anywhere, it holds here; and an Ordinal separation is required for the Dodders.

Another instance may be seen in the Coniferæ. These are often regarded as the first Order of Gymnosperms, the second and only other Order (Gnetaceæ omitted) being Cycadaceæ. Under this system, we have grouped together in various degrees of comprehensiveness—Sub-order, Genus, Section, &c.—plants so very different as Firs, Cypresses, Yews, &c. Clearly this grouping is, from a logical point of view, most objectionable. There are scarcely more marked differences between Coniferæ and Cycadaceæ than there are between certain groups of the Coniferæ themselves as thus arranged. The characters of the Coniferæ, apart from Taxaceæ, are these:—*Resinous* trees or shrubs, with punctated woody tissue; *leaves* stiff, evergreen, linear acerose or lanceolate, parallel venation, sometimes clustered with membranous sheath at the base; *flowers* unisexual and achlamydeous, *males* in deciduous catkins, closely imbricated, each consisting of one stamen or of several united, *anther* two-celled or more, dehiscing longitudinally, often crested above, *females* in cones with closely imbricated scales, no style or stigma; *ovules* one, two, or several at the base of each scale; *fruit*, a cone, each scale covering two seeds with a hard crustaceous spermoderm, sometimes winged; *embryo* often polycotyledonous. Now over against this, let us place the characters of the Taxaceæ. These too are evergreen trees or shrubs, resinous (with peculiar modifications in the secretory organs); they have disc-bearing woody tissue, and are linear in leaf; and, along with certain other resemblances, they are gymnospermous, and, for the most part, the ovules are orthotropous

nd one-coated. But if we look to the *degree* of the property onnoted by this last term, we shall find that their organisation iffers considerably from that of the Coniferæ. They have also arked peculiarities in their embryogeny and in their stem issue. Their *leaves* are decurrent and alternate, with *venation* ither forked or (in Phyllocladus) wanting; branches continuous nd inarticulate; *flowers*, dicœcious catkins, small with empty mbricated scales at base, *males* terminating in a cluster of tamens (monadelphous), each consisting of 3-8 anther-cells, nder a shield-like scale or connectivum; *ovule* single, erect, ith a small cup-shaped disc round its base, in Podocarpus and)acrydium—Sachs's Podocarpeæ—the ovules are furnished with double integument and are anatropous; *fruit*, a single hard eed, half immersed in a succulent berry-like cup or receptacle; *mbryo* dicotyledonous. Thus, notwithstanding their alliances ith the other Conifers, their differences are plainly so numerous nd such as to warrant an ordinal separation.

Examples might be taken from Genera and Species; but here will be no need. The method in every case is the same, *iz.*, to work the agreements and the differences, and to let the uling principle (of fixity and number of characters) decide. Moreover, the argument is *a fortiori*. If such be the logical onfusion in the higher grades, how much greater must it be as ve descend.

Sadly in contrast with the above timidity in giving adequate eparation to groups where the circumstances demand it, is the urrent practice in the treatment of Cryptogams. It is no ncommon thing to find Genera and Orders here constructed on he slenderest basis, and all the form of minute sub-division ept up without the corresponding import. A case in point are he Algæ. It does seem unnecessary to array these under all he grades of the classifying process when the separation turns pon so few characteristics—characteristics, too, that frequently lo not rise above form, size, and colour! There is a naïve dmission to this effect made by De Candolle in his *Laws of Botanical Nomenclature*. After laying down in Article 10 a cheme of twenty-one grades as applicable to the classifying of lants, he remarks in the *Commentary:* "In the actual state of cience, it is difficult to ascertain whether the scheme indicated n Article 10 will be quite suitable to Cryptogams".

But even in Phanerogams, we sometimes discern a tendency o over-dividing; as when, *e.g.*, an Order of Deadly Nightshade Atropaceæ) is formed by Miers distinct from the Order Sola- naceæ—the distinguishing feature being the *imbricate* corolline estivation of the former; or when Henfreya is made a Genus

of Acanthaceæ, although it is scarcely distinguishable from Asystasia.

An allied anomaly (found alike in both Sub-kingdoms) is when an Order is created with a single Genus, or a Genus with a single Species; the Genus having the same character as the Order, or the Species as the Genus. Examples are—Moringaceæ, Krameriaceæ, Equisetaceæ; Chelidonium, Platystemma, Codon. The reason for this, we are told (at least as regards Genera and Species), is in order to keep up the binominal system of naming. But surely if the system of double naming has any affinity to *per genus et differentiam*, it is simply an abuse to apply it where there is no specific difference, and even if there be no such affinity, it is still an unnecessary formality—worse than useless.

II.—But what now of the setting forth of Grades? What of the modes of exhibiting the respective characters?

The first thing that strikes one in the current methods is the want of a systematic separation of the real predicate in a character from the verbal or essential. This is logically objectionable as leading to confusion. Another fault is the perpetual repetition of the same characters under different heads. Thus, we turn up an Ordinal Character, and find it to be so-and-so. On turning next to the Generic, we find it to be in great measure a repetition of the ordinal, and ten to one the greater part of the ordinal appears under the Cohort, or the Class or Sub-class, or perhaps both. A third want, which is both crying and apparent, has reference to the use of the descriptive arts in giving the presentation—more especially of the Table. We may take these points in order.

1. All that may be said about a group or assemblage of plants falls under two heads. Either it is a statement of the structure and function of the members composing it—in other words, an enumeration of the plant processes, with an indication in the particular case of what in them is peculiar and characteristic; or it is the conveying of certain *ab extra* information about the group—such as their geographical distribution, their properties and uses, their secretions, their geological location, &c. The first is the "analysis," and answers to a *definition* in Logic; and the aim should be to make it as exact and full as possible. The second is the real predicate—not of the essence of the thing, but still vastly important; and needing also to be made as full and accurate as the circumstances will permit. The plan should be, at every grade or step to give (1) the analysis or definition, and (2) the real predicate; and care should be used to keep the two apart. Thus, we take the Order Ranunculaceæ. The "analysis" (ordinal, as distinguished from cohortal), which is the first thing

to be given, is as follows:—Herbs (except Clematis) with acrid watery juice; *leaves* radical or alternate (except in Clematis), exstipulate (except in some of the Thalictra); *sepals* imbricated (except in Clematis), deciduous, more than two; *petals* imbricated, sometimes anomalous, occasionally wanting; *anthers* dehiscing longitudinally; *pistil* apocarpous; *ovules* anatropal; *carpels* numerous, unilocular; *fruit* achene or follicle or berry or (in Nigella alone) capsule; *seeds* without an arillus; *testa* in monosperms slightly coriaceous, without prominent raphe,—in polysperms crustaceous with raphe rather prominent; *embryo* minute at base of albumen. Then comes the real predicate, which would assume the form of set composition, and would run somehow thus:—The Order characterise a cold, damp climate. In geographical distribution they are generally diffused through both hemispheres, except within the tropics, where (with the exception of Clematis) they are almost confined to mountainous districts. Of the known species, numbering somewhere about 1200, one-fifth part are European, one-seventh N. American, one-seventeenth S. American, and one-twenty-fifth Indian. Their properties are acrid, caustic, more or less poisonous, very volatile in the foliage and the herbaceous parts, sometimes very virulent in the roots. Last of all, we have a note of the Order's erratic affinities, as, *e.g.*, with Papaveraceæ, Berberidaceæ, and its resemblances, as, *e.g.*, to Rosaceæ, and to (the monocotyledonous) Alismaceæ.

2. It is an error of a greater magnitude when we find the same characters repeated under different heads. Not only is this confusing, not only is it *vain* repetition, but it bespeaks also uncertainty as to the true meaning of a "character," and it betrays greater hesitation as to the gradational limits than need be. If the distinction of grades has any significance at all, if the line can be drawn between them with even approximate exactness, it is of the first importance that each should be presented at its own value: it is a simple mockery to keep up the graded form if the matter and content be not distinct too. Thus, we take a plant (Ranunculus, for instance), a member of Lindley's Cohort Ranales. By that simple fact alone are indicated these particulars:—Besides hypogynous, free petals, we have indefinite stamens, and a minute embryo enclosed in a large quantity of fleshy or horny albumen; and if we took the Cohort Ranales from Bentham and Hooker, we should have in addition —apocarpous gynœcium. Now, these circumstances having been given as the Cohortal character, it is absurd to repeat them either under the Order or under the Genus, or indeed anywhere else. Still, if we turn to the ordinal character of the Ranunculaceæ in a botanical authority, the probability is that we shall

find it, among other things, containing this—"Stamens indefinite, hypogynous, &c." "Stamens indefinite, &c.," in like manner appears again under the genus Ranunculus, and so forth. Now, we submit, this is worse than superfluous iteration. When we wish to know the generic character, it is the *generic* character we wish to know: we do not there and then desire the ordinal and the cohortal, and perhaps the class or sub-class, too. It is the boast of Botany that, as compared with Mineralogy, its grouping-system is perfect. But *cui bono?* unless the groups be made to serve each their own purpose. Say an ordinal character, is, or ought to be, *that* and nothing else; to introduce it into the generic or specific too is tantamount to saying it is no ordinal character at all.

Closely allied to this is the habit of giving, in descriptions, contradictory alternatives. To say of a plant that its fruit is "either an achene or a capsule" is indeed to tell us something, for there are many other kinds of fruit besides these: although it does not give us the maximum of information on the subject, it still advances us a step, circumscribing the variation within a certain limit. But to say that a plant's corolla is "either regular or irregular," or its leaves "either opposite or alternate," or its embryo "either straight or curved" is really to tell us nothing. The alternatives here are contradictories, and we know without being told it that either one or the other must hold. We can only look upon this form of alternative as a round-about and clumsy way of saying that, so far as this particular is concerned, it affords us no part of the defining mark whatever.

3. Our third point deals with the *presentation* of characters.

It is plain that, if the different groups in a classification were uniformly self-contained, if their members had no affinities except among themselves, and if their differences in the midst of agreements were either few or *nil*, the description and presentation of groups would be a very easy matter. But what we actually find is—plants of the same group agreeing in some points and disagreeing in others, and groups so nearly allied to each other as to justify our placing them together in (say) a Cohort, but having nevertheless in some particulars striking resemblances to others not thus associated with them. In reference to this last case, it is clear that no single method will both meet the requirements and secure location according to the maximum of affinity at the same time. We might occasionally indulge in a double entry, but this would be justifiable only in extreme cases, and when (as in Platystemon) the number of the resembling points are pretty evenly balanced on the two sides: it would not be satisfactory to give the method a very wide application. Again, we might have recourse to the diagrammatic

presentation; but this too, from the necessities of the case, is limited. In certain transition groups, it would be necessary to have a special treatment corresponding to the special complications. But the most that can be done, as a general rule, is to note the fact of erratic resemblances (enumerating the resembling groups, and, on occasion, bringing into prominence the salient differences), and then, for the rest, to allow the descriptions at the various grades to speak for themselves. This is, in fact, a portion of the real predicate of a character, and ought to be given in close connexion therewith.

It is different, however, when the resemblances and the differences are within a grade itself. It will then be necessary to view the included members in as many lights as possible, and all available devices must be utilised and welcomed.

Two valuable devices are Diagrams and Formulæ. These, as commonly employed, have reference mainly to the reproductive organs of plants; but, even within that sphere, their value is limited. They are usually confined to *types*, and as such fail to mark deviations from the type form. Plates and Figures, again, are useful, more especially when supplementary to diagrams; they have all the advantages of a *picture*, but do not therefore dispense with the necessity of further descriptive expedients. Much value attaches to the "Analytical Key" (proceeding as it does on the principle of bifurcation),—not only as an instrument of diagnosis, but also as a means of exhibiting the affinities. But by far the best method, and the most widely available, is the use of Tables. By this means we are able to work the agreements and the differences to great advantage, and to present them in close contiguity; thereby securing precision to the statement and also producing on the mind a clear and lasting impression. It is a means also of saving repetition.

We may exemplify from the Monocotyledons. Let us take the two allied Orders Cyperaceæ and Graminaceæ, the Sedge Family and the Grass Family. These two are included in the Cohort Glumales. The question is, How shall we present them so as best to display their characters? We take the agreements and the differences and set them over against one another, in the form of tabular contrast. It is particularly desirable to vary the type of printing here, so as to catch the eye and to bring the important points into bold relief; and, for the same reasons, it is desirable that numbers should be marked in figures. AGREEMENTS.—*Flowers* in spikelets; *perianths* either none or replaced by scales or bristles; *stamens* hypogynous, 3 rarely 2; *ovary* simple, 1-celled, with 2-cleft or 3-cleft style, and 1 ovule; *embryo* lenticular. DIFFERENCES:—

	Stem.	Leaf Sheath.	Flowers.	Style.	Fruit.	Embryo.
Cyperaceæ	Solid, nodes indistinct.	Entire, ligule absent.	Each in axil of 1 bract.	Branches simple.	Pericarp not adherent to seed.	Within base of albumen.
Graminaceæ	Hollow, nodes distinct.	Split open, ligule.	Each enclosed between 2 bracts.	Branches feathery.	Pericarp adherent to seed.	Outside albumen at its base.

A group of Genera may next be taken. The three Columbine, Larkspur, Aconite (from the family Ranunculaceæ) have many points of affinity and resemblance: they form a generic cohort. Let these be stated once for all in connexion with this cohort, and let the general differences be placed beside them; and then there would remain for special treatment under the separate genera little more than expansions and expository explanations. Thus: Common Features.—Herbs annual or perennial; *leaves* divided, with distinct segments; *sepals*, 5 coloured; *stamens* numerous; *carpels* with several seeds; *fruit*, follicles. Differences.—Such and such irregularities in the calyx and corolla.

So with Thalictrum and Actæa, and other generic cohorts. And *specific* cohorts might be formed in like manner: and for these too the tabular presentation would often be found to be extremely suitable.

It is clear, however, that this method is thoroughly effective only when we can entirely separate the agreements from the differences: nevertheless it is sometimes useful even when that cannot be done. Where, for instance, in a group (say) of three, all the members have a certain number of points in common, but certain others are shared in only by two at a time, the first and third agreeing in this particular, and the second and third in that, and so on,—the Table may still be a welcome expedient. Thus, we take a group of Species from the genus Ranunculus:—Ranunculus bulbosus, R. acris, R. repens. The specific agreements of these three are,—herbs perennial, *leaves* deeply cut, and hairy, *flowers* yellow, *carpels* glabrous. These must be noted by themselves. But an instructive addition may be made by presenting in a tabular form the following *mixed* agreements and differences:—

	Corm.	Stem.	Calyx.	Flower-Stalk.
R. bulbosus	Present.	Erect without runners.	Reflexed.	Furrowed.
R. acris.....	Absent.	Do.	Spreading.	Slender cylindrical.
R. repens....	Do.	Creeping and rooting scions.	Do.	Furrowed.

It is still the same when, for the purpose of obtaining a clearer view of affinities, we bring together groups for comparison on a *single* property; as when we compare the genera of Scrophulariaceæ on the form of the corolla, or genera of the Compositæ on their common receptacle or on their fruit-achenes.

The tabular device has *degrees* of effectiveness: but, in many cases, it is the best plan that can be adopted; in others, it is the most practicable; and, in others still, it is useful by way of supplement or addition.

III.—We may now conclude by a more specific reference to the *exhausting* of characters: by which we mean, not simply greater completeness in the enumeration of plant processes, but a greater regard to the mode and the degree in which the various plant properties are exhibited. Thus, we take the Coniferæ. One distinguishing mark of these is that they have punctated (disc-bearing) woody tissue; but different groups differ in the number of the rows of these and in the disposition of individual discs. Why not note this upon a uniform plan or system? and why not make a point of noting other microscopic structures wherever they occur? Again, there are many variations in the mode of germination and growth of Dicotyledons (compare, *e.g.*, the germination of the common Pea with that of the Cyclamen, or the stem of the Oak with the fasciculated stem of some of the Malpighiaceæ); angiosperms and gymnosperms differ in all degrees in the property connoted by these terms; there are characters of a seemingly trivial and accidental kind (such as "epigeal" and "hypogeal" as applied to cotyledons) that are nevertheless constant. All these should be attended to (but are not) in the manipulating of characters with a view to classification. The same is true of the law of phyllotaxis—a law that often affords us a means of discriminating species as well as of characterising orders; as also of various other laws explained in Botanical Introductions, but not carried out into Taxological Botany. Again, we have peculiarities in the structure of the root-tip and root-cap, which mark distinct grades. We have at the top those groups of plants that possess the full complement of layers—plerome, periblem, dermatogen, root-cap; and from this we descend through at least four degrees, till we reach the gymnosperms, where we have no true root-cap and no true epidermis at the tip of the root. And still we look in vain for the employment of these peculiarities in the working out of classification. Once more, there are well-marked relations (physical and other) between certain plants and certain soils; so that, from knowing where particular plants grow, we can often infer the nature of the underlying rock, &c. Thus, Pines—although, as we are told, they will grow anywhere, except on chalky for-

mations and in land surcharged with moisture—prefer in their natural state "the débris of granitic rocks, with dry subsoil"; while "sandy loam and cool subsoil" are requisite for Firs. These and all similar facts have to be counted with and registered: and what, in a word, is needed is the consistent practice of marking degree and mode of variation, and of making use of these wherever they attain a constancy sufficient to rely on. It is only thus that botanical practice can ever be assimilated to botanical precept, and the science attain that degree of logical perfection of which it is susceptible.

WILLIAM L. DAVIDSON.

V.—THE METHOD OF KANT.

IT is no longer wise for any writer, having a due regard for his own reputation, to speak of Kant as a benighted "*a priori*" philosopher of the dogmatic type, afflicted with the hallucination that the most important part of our knowledge consists of innate ideas lying in the depths of consciousness but capable of being brought to the light by persistent digging. The labours of recent commentators have compelled us to see that this short and easy method of disposing of the Critical Philosophy is by no means satisfactory. At the same time I cannot help thinking that much of recent criticism rather shows the need, on the part of the critics, of a closer acquaintance with Kant's writings and mode of thought than calls for actual refutation. I am far from saying that Kant has produced a final system of philosophy, admitting of no development and demanding only a docile acceptance; all that I mean is, that Kant, along with much that is imperfectly worked out and even with some self-contradiction, has given us a philosophy that must be regarded not so much as a rival of English psychology as above and beyond it. I cannot accept so sweeping a condemnation of Kant's system and method as is contained in the very strong language of Dr. Hutchison Stirling, who regards the system as "a vast and prodigious failure," and the method as "only a laborious, baseless, inapplicable, futile superfetation" ('These be brave 'orts'). So very harsh a judgment, modified even as it afterwards is by the remark that "Kant nevertheless abides always, both the man and the deed belonging to what is greatest in modern philosophy" (*Princeton Review*, Jan., 1879, p. 210), seems to show a plentiful lack of intellectual sympathy on the part of the critic. Kant, in spite of the minor contradictions and the incomplete development of his theory,

as opened up a "new way of ideas," which should win general assent the moment it is seen as it really is. I propose therefore to state in my own way the main points in Kant's theory of knowledge. And, as the Critical Philosophy is most likely to commend itself to living thinkers when brought into connexion with the difficulties they feel in regard to it, I shall interweave with this statement a review of recent criticisms.

Quite recently Mr. Balfour[1] has given us a vigorous criticism of the general method of Kant, which, if conclusive, would virtually foreclose any more detailed inquiry into the merits of the Critical Philosophy. That method he holds to be radically unsound, and its main propositions therefore unproved assumptions. I am aware that Mr. Balfour directs his artillery rather against Neo-Kantians or Transcendentalists than against Kant himself. I cannot of course hold myself responsible for the opinions of all who may be called or who may call themselves Transcendentalists; but, in so far as such writers as Mr. Green and Mr. Caird are concerned, I think I may venture to say that, as they undoubtedly conceive of the problem of philosophy very much as Kant conceived of it and seek to solve it by a method similar if not identical with his, whatever applies to Transcendentalism applies in all essential respects to the Critical Philosophy.

In opening his battery against Transcendentalism, Mr. Balfour has occasion to state the problem of philosophy as he understands it. But unfortunately he has done so in terms that are fatally ambiguous. "The usual way," he says, "in which the Transcendental problem is put is, 'How is knowledge possible?'" . . . But "the question should rather be stated, How much of what *pretends* to be knowledge must we accept as such, and why?" . . . Now, "if we were simply to glance at Transcendental literature, and seize on the first apparent answers, we should be disposed to think that the philosophers of this school assume to start with the truth of a large part of what is commonly called science—the very thing which, according to my view of the subject, it is the business of philosophy to prove". . . . Nevertheless, "Transcendentalism *is* philosophical, in the sense in which I have ventured to use the term: it *does* attempt to establish a creed, and, therefore, of necessity it indicates the nature of our premisses and the manner in which the subordinate beliefs may be legitimately derived from them" (MIND, XII., p. 481).

Now Kant would certainly have been willing to admit that the problem of philosophy might be thrown into the form,

[1] The remarks that follow, on Mr. Balfour's article on "Transcendentalism" in MIND XII., are not intended as a complete reply to that article, but deal only with his general criticism of Kant's method.

"How much of what pretends to be knowledge must we accept as such?" and he would also have admitted that it is the business of philosophy to prove "what is commonly called science"; but he would as certainly have insisted at the outset upon defining more exactly what is to be understood by "knowledge" and "science". For, manifestly, Mr. Balfour's words may be taken in two very different senses: they may mean either (1) that philosophy has to prove the truth of the special facts of ordinary knowledge and the laws embodied in each of the special sciences, or (2) that philosophy must show from the nature of our knowledge that the facts of ordinary knowledge and the laws of the special sciences rest upon certain principles which make them true universally and not merely for the individual. I cannot help suspecting, from the general tenor of his criticism, that Mr. Balfour has allowed these very different propositions to run into one in his mind; so that, having shown, as he very easily may do, that Kant does not prove the first, he rashly concludes him to have failed in proving the second. Surely Mr. Balfour does not seek to lay so heavy a burden on philosophy as is implied in the demand to prove the truth of the special facts of observation and the special laws of the natural sciences, or even the generalisations of empirical psychology. No one, I should think, would seriously ask a philosopher to prove it to be a fact that we have experience, say, of a ship drifting down a stream, or that the three interior angles of a triangle are equal to two right angles, or that bodies attract each other in proportion to their mass and inversely as the square of the distance. Manifestly, if philosophy is to attempt a task of this kind and magnitude, it must go on for ever without reaching any final conclusion, for the special facts and laws of nature are infinite in number. Philosophy has certainly to do with the proof of knowledge, but he would be a very foolish philosopher who should attempt to unite in himself the functions discharged by all the special sciences. "The sceptic," says Mr. Balfour, "need not put forward any view of the origin of knowledge." The sceptic is a privileged person, and of course need not put forward any view about anything; but, supposing him to be reasonable, he will not dismiss without inquiry the view of those who hold that the question as to "the origin of knowledge" is *the* question of philosophy. The follower of Kant, at any rate, must refuse to have the formula which best expresses the problem of philosophy as he understands it, replaced by the very different formula, How much of what pretends to be knowledge must we accept as such? if by this is meant, How are we to show that this special fact or law is true? The special facts of ordinary knowledge and the special laws of the natural sciences are not propositions which the philosopher seeks to prove, but

data which he assumes. Of all our knowledge the conclusions reached by mathematics and physics are those which we have least doubt about; and hence I do not understand how Mr. Balfour can object to the philosopher assuming to start with "the truth of a large part of what is commonly called science". I have no objection to find with Mr. Balfour's assertion, that a philosophy must consist partly of premisses and partly of inferences from premisses. I should certainly prefer another mode of expression, from the fact that the process of inference, according to the account given of it by formal logic, does not allow of any inferences except those which are purely verbal; but, as Mr. Balfour probably only means to say that there are certain facts which do not stand in need of proof by philosophy and certain conclusions which it is the business of philosophy to prove, I am content to accept his way of stating the case. My objection lies against what he very strangely supposes to be the "premisses" of Transcendental philosophy. The actual premisses of Kant are the special facts of ordinary experience in the widest sense, and especially the facts and laws of the mathematical and physical sciences. No doubt the particular philosophical theory we adopt will cast upon these a new light, but it will in no way alter their nature or validity. Should the Kantian explanation of the essential nature of knowledge be accepted, a new view of the process by which knowledge has been obtained, and therefore a new view of the general character of the objects of knowledge, will grow up; but the facts themselves will remain just as they were before. The philosophical theory, that the existence of concrete objects apart from the activity of intelligence by which they are constituted for us, is an absurdity, does not throw any doubt upon the scientific truth, that bodies are subject to the law of gravitation. The evidence for a special scientific law is purely scientific. The philosopher who should attempt, from the general nature of knowledge, to establish a single individual fact or a single specific law of nature, would justly draw upon himself the censure of going by the "high priori roads" leading to the kingdom of shadows. From a general principle only a general principle can be inferred: the proof of a special law demands special evidence. If a philosopher may by an examination of the nature of knowledge establish a single qualitative fact, why should not he evolve a whole universe out of his individual consciousness? If the sceptic is so unreasonable as to ask the philosopher to prove the truth of any law of physics, the philosopher will at once refer him to the physicist: all that he pretends to do is to show that the law is not a mere fiction of the individual mind, but can be accounted for by the very nature of human intelligence. On the other hand, should the philosophical

theory advanced be such as to reduce our knowledge to a mere series of individual feelings, we shall of course have to admit that the facts of individual consciousness have no universality or necessity; we shall, in other words, be compelled to say that there are no facts, in the ordinary sense of the term, but only supposed facts, or, if you will, fictions. It will no longer be safe to say that there is a real connexion between objects, but we may at least say that there is a real connexion between what we ordinarily understand by objects. The empirical philosopher, with the fear of Mill before his eyes, may hesitate to say that two and two are four, but at least he will feel entitled to say that two objects added to other two are for us four.

It may be, however, that Mr. Balfour admits all this. In that case the problem of philosophy will be for him, as for Kant—What are the universal principles which are presupposed in the facts of our ordinary and scientific knowledge? But, if so, I must take the strongest exception to Mr. Balfour's way of stating the "premisses" of Kant and his followers. The problem being to show how we may justify the knowledge we all believe we possess by an exhibition of the nature of our intelligence as manifested in actual knowledge, it is manifestly inadequate and misleading to say that the Transcendentalist begins by begging the sceptic to admit "that some knowledge, though it may only be of the facts of immediate perception, can be obtained by experience: that we know and are certain of *something—e.g.*, of a coloured object or a particular taste". The Transcendentalist, unless I am altogether mistaken, would not state the matter in this way at all. Kant at least would not ask anybody to admit that he has *just a little* knowledge; much less would he ask him to grant that he has a consciousness of a coloured object or of a particular taste. The difficulty is not at all a quantitative one. Nothing is gained by reducing the facts "postulated" to a minimum, so long as the sceptic is asked to admit a fact at all; and if he does admit such a fact as the immediate perception of a colour or a taste, why should he refuse to grant the carefully established laws of the special sciences? Is the evidence for the consciousness of the law of gravitation less urgent than the evidence that a coloured object is perceived? What the sceptic should object to is not the mere *number* of facts assumed as true, but the assuming that *any* facts are true, in the sense of being more than the assumptions of the individual. What I object to, the sceptic may say, is the assumption that the particular facts and laws which no doubt exist in our consciousness, are universally and necessarily true; I ask you therefore to prove the supposed absoluteness, objectivity, or necessity—state it as you please—of these facts and laws. The request is perfectly

reasonable, and the father of Transcendentalism claims that he has in all essential respects resolved the sceptic's doubt. It is in the process by which he endeavours to prove that there are universal and necessary principles underlying knowledge and making it real or objective, that Kant is led to refer to such simple experiences as the consciousness of a coloured object or of a particular taste; but he does so, not because he has more faith in such immediate feelings than in the established laws of science, but, on the contrary, because he has no faith in them at all. The argument is indirect, and proceeds somewhat in this way:—If the philosophical theory be maintained that all external concrete objects are *without consciousness*, an attempt must be made to account for knowledge from a mere "manifold" or detached series of impressions—as, for example, the impression of a bright colour or a sweet taste; and from such an attenuated thread of sensation no explanation of the actual facts of our experience can be given. Kant, in other words, argues that you must *not* suppose an unrelated feeling to be a constituent of real knowledge. Mr. Balfour completely misses the point of the reasoning, and actually supposes Kant to be begging the sceptic to grant him the fact of a little knowledge, in order that he may go on to extract from it a great deal more.

Philosophy presents itself to the mind of Kant with an antique largeness and nobility of conception. Psychology, which with us is usually made to bear the whole burden and strain of philosophical thought, he regards as a special branch of knowledge ranking in scientific value along with chemistry, and standing below those sciences, which, as admitting of mathematical treatment, assume the most precise and the most systematic form. His impulse to philosophise arises in the first place from his interest in such purely metaphysical questions as the existence and nature of God, the freedom of the human will, and the immortality of the soul. His ultimate aim is, in the language of Lewes, to lay the "foundation of a creed". But he soon discovers that, in our common knowledge and in the mathematical and physical sciences, certain principles are tacitly assumed, which are not less metaphysical than those commonly bearing the name. We are perpetually making use, for example, of the principle of causality, and the natural philosopher assumes the truth of such propositions as the indestructibility of matter. Thus an examination into the nature of human knowledge is forced upon us, both as a means of determining the limits of our real knowledge and of justifying, if that be possible, the universal and necessary principles which are embedded in ordinary experience and the special sciences. Until we determine the essential conditions of human know-

ledge, it seems vain to attempt the solution of the more ambitious problem as to supersensible realities. Hence Kant seeks, by starting from what every one admits, to discover whether or no those purely metaphysical questions are capable of any solution. And it is his special charge against all previous philosophy, that, from neglect of this preliminary criticism, it has fallen either into a dogmatism that can give no reason for its existence, or into a scepticism that can only be a temporary phase of thought. His aim is thus in one way dogmatic, but it is a dogmatism which comes as the crowning result of a critical investigation of the nature of knowledge, enabling us to distinguish demonstrable from indemonstrable or problematic assertions. The *Critique of Pure Reason* undertakes the preliminary task of determining what are the ultimate constituents of knowledge, and this cannot be done without drawing in outline the sketch of a true metaphysic, the details of which, as Kant asserts, can easily be filled in by any one who has firmly apprehended its main features. Hence we are told that "we must have Criticism completed as a science before we can think of letting metaphysics appear on the scene" (*Prolegomena*, Vorrede, p. 9, ed. Hartenstein). Metaphysic is thus compelled to undertake a kind of investigation which is not required in other branches of our knowledge. Other sciences may probably occupy themselves with the agreeable task of increasing the sum of knowledge; metaphysic before it can make a single dogmatic assertion, must first prove its right to exist. Failure to apprehend this fact has led in the past to aimless wandering in the region of mere conjecture, and to the continual alternation of over-confident dogmatism and shallow scepticism. The first and most important task of philosophy is therefore to prove that there are metaphysical propositions implied in our ordinary knowledge, which can be established upon a secure foundation; and, as it turns out, that the propositions ordinarily known as metaphysical do not, at least by the theoretical reason, admit of either being proved or disproved. Thus the inquiry into the nature of knowledge proves to be at the same time a discovery of the limits of knowledge.

The first problem of Critical Philosophy—one that is necessarily bound up with the second—is, How can there be any knowledge of real or objective existence? The question, as Mr. Green has pointed out, is not, *Is* there real knowledge? but *How* can there be real knowledge? It is true that we may give a meaning to the first question by interpreting it to mean, as Mr. Balfour does, How am I to distinguish real from pretended knowledge? but, on Kant's view, this is only another and less definite way of asking how knowledge is possible. For we can

only separate real from apparent knowledge by pointing out what are the essential conditions of there being any real knowledge for us, and this is just another way of asking, How is knowledge at all possible? By determining what are the conditions of knowledge, we at the same time determine indirectly what is not real knowledge. Now, an inquiry into the nature of knowledge must in some way comprehend all the facts that make up the sum of knowledge, and hence, to find the problem workable at all, we must get these facts into a convenient and portable shape. But this has in large measure been already done for us. Our common-sense knowledge of the world of nature and of the world of mind has been carried up into a higher form in the mathematical and physical sciences, on the one hand, and in psychology, on the other; and from these we may therefore start as from facts that every one admits. Thus the general and somewhat indefinite question, How is knowledge possible? breaks up into the two closely connected questions, How is mathematical knowledge possible? and How is scientific knowledge possible? We are not here concerned with the special truths of mathematics or physics or even psychology, but only with the necessary conditions without which there could be no mathematical or physical or psychological knowledge. The special truths of these sciences we assume to be true: they are the facts from which we start, not the conclusions which we desire to reach. Our object is to discover, by a consideration of the nature of human intelligence, what are the essential conditions without which there could be no sciences of mathematics, physics and psychology. What hypothesis, then, are we compelled to adopt, assuming the truth of these sciences?

As to Kant's method of solving this problem, we may say that, like the scientific discoverer, he sought for an hypothesis adequate to account for the facts in their completeness. The only exception that may properly be taken to this way of putting the matter is, that it is not so much a statement of the peculiar method of Kant, as of the method by which all knowledge is advanced. It is rather a truism than a truth, that the discoverer must cast about for some hypothesis that will harmonise with the facts he is seeking to explain. The merit and characteristic difference of Kant's method lies not simply in setting up tentatively a hypothesis and testing it by admitted facts, but in the comprehensiveness with which he has stated the problem of philosophy, and in the special solution he proposes. Like all discoverers, he began with certain facts which he sought adequately to explain, and, like them, he was assisted in making his discovery by observing the failures of his predecessors. This accounts to a great extent for the peculiarities of his mode of

statement. All through the *Critique* he combines with a statement of his own theory of knowledge a polemic against the theory of others. This union of exposition and criticism makes it peculiarly difficult to follow the course of his thought. In a sense his method is dialectical; that is to say, he brings forward certain propositions as if they were precise statements of his own theory, when in reality they are merely stages in the gradual evolution of his thought. Thus he not infrequently speaks of "sensible objects," or "objects perceived by the senses," as if sense of itself were an independent source of knowledge, instead of being merely, in the critical meaning of the term, a logical element in knowledge. So also he speaks of an abstract conception and a category, of an analytical judgment and a synthetical judgment, and of "experience" in its simple and in its philosophical sense, as if each of these terms belonged to the same stage of thought. In truth it must be admitted that Kant was, to some extent at least, the victim of his own mode of statement; for while he always keeps the ordinary conceptions in regard to knowledge distinct from the purely critical formulation of it, it cannot be said that he has completely harmonised in his own mind the two very different points of view.

The distinction, then, between the data from which he starts and the philosophical theory by which he endeavours to account for them, is never absent from Kant's mind. It does not seem to have occurred to Kant that any one would refuse to admit that mathematics, physics and psychology do as a matter of fact contain propositions that are true within their own sphere. Repeatedly he states this assumption in perfectly definite language. Mr. Balfour himself quotes from the *Critique* Kant's remark, that "as pure mathematics and pure natural science certainly exist, it may with propriety be asked how they are possible; for that they must be possible is shown by the fact of their really existing". And many other passages might be cited to the same effect. Thus he remarks, in the *Prolegomena* (§ 6, p. 29), that pure mathematics is "a great and well established branch of knowledge"; and, again, in speaking of Hume's mistake in supposing mathematical judgments to be analytical, he remarks that had Hume but seen that his onslaught on metaphysic was virtually an attack on mathematics as well, the good company into which metaphysic would thus have been brought would have saved it from the danger of a contemptuous ill-treatment, for the thrust intended for it must have reached mathematics, and this was not and could not be Hume's intention" (§ 4, p. 20). Kant was mistaken about Hume's "intention," as Mr. Mahaffy and others have noted, but as to his own opinion

there can be no possible mistake. But perhaps the clearest passage of all is that in which he says that "pure mathematics and pure science of nature had no occasion for such a deduction as we have made of both for *their own* safety and certainty, for the former rests upon its own evidence, and the latter upon experience and its thorough confirmation. Both sciences therefore stood in need of this inquiry, not for themselves, but for the sake of another science, metaphysic" (§ 40, p. 75). Kant therefore invariably assumes the truth of the mathematical and physical sciences, and only asks how we are to explain the fact of such knowledge from the nature of knowledge itself. It is true that he qualifies this unlimited statement, so far as to admit that the special sciences are ultimately dependent for their truth upon philosophical criticism; but the qualification applies, not to the special truths which form the body of those sciences, but to the universal principles which they take for granted, and which, strictly speaking, belong to metaphysic. "The possibility of mathematics," he says, "may be conceded, but by no means explained without [metaphysical] deduction." That is to say, while no one can doubt that mathematical judgments are universal and necessary, this must be an article of faith, until we discern philosophically the ground of their universality and necessity. But this does not mean that proof is demanded of the special truths of mathematics, but only that, in accounting for knowledge, we must find out the secret of their universal character. Kant's problem is therefore the purely metaphysical one as to the objective validity of the knowledge we possess, not the scientific problem as to the evidence for the truth of special laws. No doubt, Kant would have admitted that a failure to account for the possibility of real knowledge must throw doubt on the absolute truth of the conclusions of mathematics and physics, since these sciences cannot get along without making use of principles which they do not seek to prove; but Kant's attitude toward the scepticism of Hume and his unwavering faith in the truth of the sciences show us that his conclusion in that case would be, not that science has no truth, but that the metaphysical theory propounded is marred by some inherent flaw. The extreme scepticism which Mr. Balfour's language suggests would have seemed to him a voluntary creation of self-tormenting difficulties. The truth of mathematical definitions as such was in his view necessarily mathematical, and of physical propositions physical, and it would have seemed to him mere folly to ask philosophy to prove what no one denies: it is surely enough, he would have said, if I show that my system is consistent, and alone consistent, with the undoubted truths of mathematics and physics.

In developing his proof, as has been said, Kant was warned by the utter failure of previous dogmatic systems—a failure which he regards Hume as having proved beyond dispute, so far at least as the principle of causality is concerned—that the mode of explanation must follow a completely new track. The inherent vice of those systems betrays itself in the double defect (1) that it assumes knowable objects to exist, in the fulness of their attributes and in their relation to each other, quite independently of our intelligence; and (2) that, as a consequence, it supposes that we can by mere introspection or analysis obtain judgments which hold good of things-in-themselves, and are therefore true, not merely subjectively or for us as individuals, but objectively, *i.e.*, universally and necessarily. This twofold assumption is a characteristic mark of dogmatism. In the statement of his own theory, Kant starts from the dualism of knowledge and reality, and seeks to develop a true theory by a gradual transformation of the false theory. Adopting the objection made by Hume against the ordinary proof of causality, and expressing it, to borrow the language of mathematicians, in its utmost generality, he points out that the principle upon which it goes cannot possibly account for the fact of real knowledge. (1) If, as the dogmatist assumes, known objects are without consciousness and yet are known as they exist, we must, to account for that knowledge, say that we go to them and apprehend them one by one, and also observe that they are permanent, that they undergo changes, and that they act and react on each other. Our knowledge of concrete things, and of their succession and co-existence, is thus resolved into a series of particular perceptions. Philosophically, therefore, the dogmatist tries to account for our knowledge of real objects by saying that they are revealed to us in the individual apprehensions or perceptions which come to us from without. Now, granting in the meantime that things exist without consciousness just as they are known, it is plain, that so far as our actual knowledge goes, and so far therefore as the dogmatist is entitled to affirm, knowledge resolves itself into a succession of feelings or ideas in consciousness. But the most that we can philosophically base upon a series of feelings or ideas is a knowledge of particular objects, particular series of events and particular co-existences. This was what Hume pointed out, so far as the sequence or causal connexion of events is concerned. I observe flame immediately after I have observed heat, and finding this particular sequence repeated frequently in my consciousness, I infer that flame is actually connected with heat, and that the one cannot exist without the other. The inference, however, is unwarranted. All that I can legitimately say is that in my past experience as

remembered, and in this particular experience I am now having, flame and heat occur successively. Individual perceptions of such sequences I have, but the inference based upon them, that these could not be otherwise, arises merely from the nature of our imagination, which illegitimately goes beyond the immediate perception, and converts it into a universal rule. On perception, as we may say, generalising Hume, no judgment in regard to the existence of real objects, or of their connexion or co-existence, can properly be founded. The reality of the objects, or of the relations of objects, as a judgment is something that *we* add to perception, not something actually in perception. (2) This leads us to ask whether we are more successful when we attempt to prove the permanence, the causal connexion, or interaction of objects, from conceptions instead of perceptions. Now conceptions are for the dogmatist, simply ideas in the mind, which are completely separated from things without the mind. The conceptions of the permanence, the changes and the mutual influence of substances, are separated by an impassible gulf from substances themselves. It is thus perfectly evident that we cannot legitimately pass over from the conception of a substance to the substance itself. Completely shut up within our own minds, we shall vainly endeavour to break through the walls of our prison. We can certainly frame judgments in regard to the ideas which exist in our minds, but we cannot show them to have any application to real objects or events. Thus, having the conception of substance, we may throw it into the form of the judgment, "Substance is that which is permanent". Such a judgment is no doubt correct so far as our conception is concerned, and is even necessarily true, in the sense that it is free from self-contradiction or conforms to the logical principle of identity, but it has no demonstrable relation to the real substances we suppose to exist without consciousness. All that we have done is to draw out or state explicitly what was contained in the conception with which we started, and however necessary and valuable this process may be in making our conception clear, it is valueless as a means of proving the reality of objects supposed to correspond to it. The mere analysis of the conception of substance no more shows that there are real substances *in rerum natura* than the conception of a hundred dollars entitles us to say that we have a hundred dollars in our pocket. Now dogmatism never gets beyond purely analytical or tautological judgments of this kind; the account it gives of the nature of knowledge is such that we cannot understand from it how it is possible to have the experience of real objects or of their connexion. We may therefore sum up Kant's objection to previous philosophy as fol-

lows :—Knowledge of real objects existing beyond the mind, and of their connexion and interaction, must be obtained either from perceptions or from conceptions; but perception cannot take us beyond the consciousness of particular objects as now and here, and conception tells us nothing at all about such objects; hence dogmatism cannot explain the possibility of knowledge at all.

So far Kant has closely followed in the wake of Hume, at least as he understood him, the main difference being that whereas Hume shows the imperfection of dogmatism only in regard to the principle of causality, Kant universalises the criticism and throws it into the comprehensive form. Real knowledge cannot be accounted for from mere perceptions or from mere conceptions. It is in fact the great merit of Hume in Kant's eyes, that he shows with such clearness wherein the weakness of dogmatism lies. All *a priori* judgments, *i.e.*, judgments derived from conceptions, seem to be merely analytical, and therefore, however accurately I may analyse the conception of cause, I can never get beyond the conception itself. The supposition therefore, as Hume argues, that the conception of causal connexion proves a real connexion of objects is a pure assumption. The moment I am asked to explain how I get the knowledge of objects, I must refer to my perceptions, and no perception can entitle me to make universal and necessary affirmations. Expressed in the language of Kant, Hume's difficulty is this: How can the conception of cause be thought by the reason *a priori*, and therefore possess an inner truth independent of all experience? And this question, when put universally, assumes the form, How are *a priori* synthetical judgments possible? Hume indeed does not content himself with pointing out the purely subjective character of the notion of causality, but endeavours to explain how we come to suppose a necessity where none exists; and in this Kant refuses to follow him. A series of perceptions can never yield necessity, for however frequently a given perception follows another we cannot thence conclude that they must follow each other. Our belief in the connexion of perceptions is therefore explained by the psychological law of frequency or repetition: we naturally suppose that what is often associated is really connected, and thus by the influence of custom we confuse an arbitrary association of our ideas with a real connexion of objects. Accepting Hume's criticism of dogmatism, and rejecting his psychological account of the principle of causality, Kant endeavours to show that we can have a synthetical *a priori* judgment of causality, as well as other judgments of the same kind which Hume altogether overlooked.

We can now see why Kant states the problem of philosophy as he does, and what is the general method he is likely to follow in attempting to answer the question, How are synthetical judgments *a priori* possible? As the failure of dogmatism evidently arises from the assumption, which no one prior to Kant had questioned, that objects and events exist beyond consciousness as they are known, it was only natural to ask whether this assumption may not be a mistake. The general answer therefore given by Kant to the problem he has himself propounded, is that known objects, instead of being passively apprehended, are actively constructed by intelligence operating on the material supplied by the special senses. The existence of things-in-themselves is not indeed positively denied, but such things are shown to be absolutely distinct from the objects we actually know. The theory that intelligence constitutes known objects instead of passively apprehending them, is held to be the only theory that explains the facts as a whole. In the development of his proof, we find Kant continually seeking to intensify the persuasiveness of his own solution, by showing the inherent imperfection of the dogmatic conceptions previously accepted as conclusive. His method of proof thus takes, in many cases, an indirect form. All through the first part of the *Critique*, we find him asserting, that unless we admit the activity of intelligence in the constitution of knowledge, we are reduced to a "mere play of representations," or, what is at bottom the same thing, we are compelled to attempt the impossible feat of extracting reality from subjective conceptions. These two things always go together in Kant's mind; the impossibility of justifying universal and necessary judgments from a mere manifold of sense, *i.e.*, from an arbitrary succession of feelings, and the impossibility of accounting for knowledge on the supposition that known objects are things-in-themselves independent of our intelligence. When he proposes to show why mathematical judgments are apodictic and yet refer to individual figures, &c., he points out, on the one hand, that they cannot be obtained by an analysis of perceptions and, on the other hand, that their demonstrative character is unintelligible if we suppose the objects of mathematics to be known by particular observations of sense or by empirical measurements. In proving the principle that the knowledge of permanent substances is one of the conditions of a real knowledge of objects in space, he shows that, apart from the schemes of the "permanent," we can only have a number of unrelated feelings which by no possibility can be identified with real substances; and in confirmation of this criticism he remarks, that the ordinary derivation of permanent things from the conception of substance assumes that an analytical or tautological

judgment is capable of bridging the gulf between individual conceptions in the mind and things-in-themselves. So, in his proof of causality, he seeks to show that our knowledge of a real sequence of events can be accounted for, neither from an arbitrary train of feelings coming one after the other without determinate order or connexion, nor from the mere conception of cause as we find it lying ready-made in our minds; for, in the former case, we are not entitled to say that there are real sequences but only that there are sequences of our perceptions, and, in the latter case, we have no criterion by which to distinguish the conception of cause from an arbitrary creation of the imagination. Again, the existence of a primary self-consciousness he establishes, both on the ground that a succession of states of consciousness, not bound together by a single identical self, will not account for the systematic coherence and unity of our actual experience, and on the ground that the mere fact of having a conception of self as one does not prove the self to be one in its own nature. Lastly, in the "Refutation of Idealism" this indirect method of proof assumes an open and explicit form: the argument being, that the "psychological idealist" can never show that the mere sequence of ideas in the individual mind could give us the knowledge of real substances as permanent; that, on the contrary, we could never have experience of the self as in time, had we no knowledge of real objects in space. It should be observed however that this polemic against dogmatism might be eliminated from Kant's proof without really destroying its intrinsic force. The transcendental proof has assumed this form chiefly from historical causes, and Kant, in stating it as he does, only intends to commend to the lips of the dogmatist the ingredients of his own poisoned chalice. The conclusiveness of the theory does not lie in this indirect mode of proof, but in the completeness with which it accounts for the facts of experience as a whole. Kant might have stated his proof altogether in the affirmative form that known objects must exist in relation to intelligence; and, having done so, the details of the system would have consisted entirely of a presentation of the essential elements of knowledge in their relation to each other. The "manifold of sense," or "flux of sensations," is not, as Mr. Balfour seems to suppose, a ghost of Kant's raising, but the unlaid ghost of dogmatism itself. Transcendentalism "convinces by threats" only in so far as, like every other system of philosophy, it must take some account of accepted systems that differ from it.

If the above is at all a correct account of Kant's problem and method, the objections of Mr. Balfour have been virtually disposed of beforehand. Those objections seem to me to be rather

the difficulties which naturally occur to one who has not yet seen into the heart of the system, but looks at it from the outside, than the sympathetic and luminous criticism of one who, by the very act of mastering and thoroughly assimilating the thought of another, is already, as Fichte remarks, to some extent beyond it. This judgment can only be completely justified by an examination of Mr. Balfour's objections to the proofs of Substance and Causality, and to the "Refutation of Idealism"; but, even without a special consideration of these, one may see that his criticism is destitute of that sureness and lightness of touch which can only come from the closest familiarity with the subject. What the Transcendental Philosophy is called upon to prove is, we are told, that the principles it asserts to be true are "involved in those simple experiences which everybody must allow to be valid" (MIND, XII., p. 483). Now, in the first place, there is no need, as has already been indicated, to lay special stress on "simple" rather than on complex experiences. When Kant is speaking of experience as data he has to explain, he places scientific truths on the same level as common-sense knowledge, and with the whole body of experience as thus understood, he contrasts purely philosophical knowledge as a higher consideration of the facts common to both. In speaking of the distinction between mathematical and philosophical knowledge, he remarks, that the essential difference between these two modes of knowledge lies in the fact that the former sees the particular in the universal, and the latter the universal in the particular; and that those thinkers who propose to distinguish philosophy from mathematics on the ground that the former deals with *quality* and the latter with *quantity*, have confused a difference in the objects of those sciences with the true difference, which consists entirely in the point of view from which the objects are regarded (*Kritik der reinen Vernunft*, pp. 514 ff, Ed. Hartenstein). In the second place, Mr. Balfour, unless I misunderstand him, entirely misrepresents the method of Kant, when he speaks of certain "principles"—by which he means, I suppose, such judgments as the permanence of substances, the causal connexion of events and the like—as "involved in" our simple experiences. We may say that the principle, say of causality, is involved in our experience, in the sense that an analysis of our ordinary beliefs will show that as a matter of fact we do suppose events to be really connected together. Everyone is "natural philosopher" enough to know, that "the property of rain is to wet, and fire to burn: that good pasture makes fat sheep; and that a great cause of night is lack of the sun". Mr. Balfour's words may therefore mean that, while everyone has the belief that there is a real connexion between certain known objects, it is

only by a process of abstraction that we learn to throw this belief into the general form of a principle, and to affirm, not that fire is the cause of heat and rain the cause of wetness, but that every event has a cause. I am loath to suppose that Mr. Balfour is under the impression, that the Transcendentalist has no other means of establishing his principles than simply taking our ordinary beliefs, abstracting from the concrete or individual element in them, and straightway baptising the residuum by the name of a "principle". For this is just what Kant means by dogmatism, consisting as it does in the mere explicit statement of what is wrapped up in our ordinary conceptions. By such a process, as Kant points out, we can only frame analytical judgments that do not take us a single step beyond the assumptions with which we begin. And yet it is difficult to resist the conviction that Mr. Balfour has fallen into this mistake, when we find him saying, that the principles of the critical philosophy are the "casual necessities of our reflective moments," which are supposed to be established by showing that they have "always been thought implicitly"; and that "to argue from these necessities [the principles] to the truth of things is to repeat the old fallacy about innate ideas in another form" (MIND, XII., p. 489; cf. p. 484). What these utterances mean, except that Kant and his followers endeavour to prove the truth of their principles by an analysis of their ordinary beliefs and perceptions, I am unable to understand. Kant's doctrine can only be assimilated to "the old fallacy about innate ideas" on the supposition that it assumes certain conceptions as true, and proceeds to "deduce," or set forth in abstract language, what is implied in them. But this is exactly what Kant does *not* do. If he has one merit more than another it is that he has disposed for ever of the supposition that knowledge may be justified by merely analysing the beliefs we happen to possess. Instead of admitting the absolute separation of thought and reality, an assumption underlying and vitiating the whole procedure of dogmatism, Kant maintains that reality is meaningless apart from its relations to thought. Mr. Balfour's mode of statement can be regarded as a correct formulation of the method of Transcendentalism, only if we suppose him to mean that the facts and laws of our whole experience imply or presuppose certain principles belonging to the constitution of our intelligence; and, when it is understood in this way, his objection loses any force it seemed at first to possess. But let us consider Mr. Balfour's criticism more in detail.

Let us suppose the transcendentalist to be asked by the sceptic how he proves the absolute truth of such a principle as that of causality. The reply, according to Mr. Balfour, will consist in begging the sceptic to admit that we "get some know-

ledge small or great by experience"; and, having obtained this very moderate concession, he will proceed to show that his transcendental necessities or principles are involved in it. To take a concrete instance, the sceptic may be asked whether he admits that we have an experience of *change*, and if he assents, the transcendentalist will attempt to show that experience "is not possible unless we assume unchanging substance". Or again, the sceptic, enticed into the admission that we have an experience of real events, is straightway forced to admit that such an experience is only possible if we virtually think of those events as under the law of causation. The essence, then, of the Transcendental method consists in showing, or attempting to show, that, in questioning the truth of such principles as substantiality and causality, the sceptic contradicts himself, since he grants the reality of certain experiences and yet "makes an illegitimate abstraction from the relations which constitute an object". He has therefore either to rescind his admission of the reality of the object, or to admit that a certain principle is involved in his knowledge of it. "He cannot, in all cases at least, do the first; he is bound therefore to do the second" (MIND, XII., pp. 482 ff.).

I acquit Mr. Balfour entirely of any intentional misrepresentation of the Critical Method; but the fact is not the less certain, that he has given, not a fair statement, but a travesty of it. I see nothing, in his way of stating the case, to distinguish Criticism from Dogmatism. Mr. Balfour's criticism of the "Refutation of Idealism" seems to show, that he has not carried his scepticism so far as to doubt the correctness of the ordinary dualism of intelligence and nature. But without appreciating in the clearest way the essential absurdity of this dogmatic assumption, the method of Kant is simply unintelligible. The only way, Mr. Balfour evidently thinks, in which the Transcendentalist can seek to make good his position, is by analysing, after the method of formal logic, the ordinary or uncritical knowledge which we all possess. The Transcendentalist is supposed to reason, that cause, substance, &c., are really thought, although only in an obscure way, by us in our ordinary consciousness. And no doubt this is true enough; but it is not that which constitutes the essential nerve of proof. If this were the sole force of the argument, Mr. Balfour's objection, that the principles are assumed, not proved, would be perfectly sound. The explicit statement of the implications of ordinary experience cannot prove the necessity and universality, or what is the same thing, the objectivity of the principles in question. The ready answer to such reasoning is, that no reflection upon our ordinary beliefs that does not in some way transform the current view of them,

can justify us in asserting that they are laws of nature. What Kant maintains is, that, reasoning back from our actual experience, we perceive that there are certain forms of intelligence without which there could be no experience at all. His method is, starting from our ordinary knowledge of concrete facts, and from our ordinary dogmatic judgments in regard to them, to show that we can never prove the reality of the facts, or the objectivity of our judgments concerning them, so long as we oppose thought and nature as abstract opposites. This Kant endeavours to make intelligible to the dogmatist by saying, that the observation of independent objects owing nothing to intelligence, can never yield real knowledge, because it cannot take us beyond an empirical "is". And this led Kant to say, that, while intelligence may be dependent on separate impressions for its apprehension of the determinate properties of things, it is yet active in combining or relating these impressions, and so constituting them as real individual objects, real events and real coexistences. It is only in accordance with Kant's method of thought to say, that he who maintains the independent reality of things *as known*, and denies to intelligence any share in the construction of that reality, must attempt to account for the knowledge, which we at least seem to possess, without any other materials than separate impressions. What else indeed can there be if we assume that thought has nothing to do with the constitution of phenomenal objects? On the other hand, supposing known objects to exist only in relation to our faculties of knowledge, intelligence must have certain functions of synthesis, which at once combine into unity the detached differences supplied by the special senses, and enable us to explain how we can have a knowledge of objects other than our own subjective conceptions. For if nature exhibits everywhere a system and unity of objects, which have been actively constructed by thought acting upon the manifold of sense, the puzzle which dogmatism completely fails to solve at once disappears; we are no longer perplexed with the essentially unmeaning riddle, How can we pass from conceptions in the mind to objects without the mind? for objects as known have no existence except in relation to the intelligence by which they are made real. The functions of synthesis, or potentialities of combination, we may, if we please, call "relations"; but it must be observed that they are able to operate whether they are brought into explicit consciousness or no. A function is not an "innate idea," but the potentiality of an indefinite number of cognitions. But how do we know that thought has such functions? We know it because the workmanship of thought is manifested in actual knowledge or experience, in so far as we combine and unite impressions, and thus form

judgments about real things. From the fact that we have scientific knowledge, we are enabled to reason back to the functions of thought by which such knowledge is made possible. We do not beg the sceptic to admit that, in our immediate perceptions, there are involved principles which we can discover by mere analysis, and that, unless this is granted, we are making "an illegitimate abstraction from the relations which constitute an object"; but we ask him to explain how there can be a knowledge of objects apart from the activity by which intelligence constitutes them. Kant has no thought of cajoling the sceptic, or anybody else, into the admission that there is a confused metaphysic even in such simple experiences as a perception of colour or a feeling of taste; all that he asserts is, that any one who is earnest in his endeavour to account for our experience in its totality must come to the conclusion that intelligence contributes the essential element in the constitution of the known universe. And those who refuse to accept his theory of knowledge he asks to explain how real knowledge can be derived from a mere analysis of conceptions, or from the perpetual rise and disappearance of individual feelings.

In this sense alone, and not in the sense that each of us has a confused consciousness of the "relations which constitute an object," do Kant and his followers hold that there can be no objects apart from the relations of thought. Mr. Balfour objects, quite in the vein of Locke's criticism of Descartes' innate ideas, that "the majority of mankind have habitually had certain experiences without ever consciously thinking them under the relations" asserted to be implied in them; and, from his point of view, he very naturally objects that, as an implicit thought is "simply a thought which is logically bound up in some other thought," it is "a mere possibility which can be said to have existence only as a figure of speech". The simple reply to this is that when certain relations are said by the critical philosopher to be involved or implicit in ordinary experience, all that is meant is that they are manifestations of the activity of intelligence in relation to its own objects. That the majority of mankind do not consciously bring these relations before their minds only shows that they are not metaphysicians; it does not show that they can know objects which, by definition, are beyond consciousness altogether, and are therefore in the strictest sense unknowable. Intelligence, as Kant maintains, has an essential nature, which comes into operation in our actual experience; but the recognition of this fact must necessarily be made only after actual experience has been had. Mr. Balfour asks how it comes that, "if relations can exist otherwise than as they are thought, sensations cannot do the same" (MIND, XII., p. 488).

The answer of course is that a sensation can only exist as it is felt, whereas a function of thought must operate before we can be conscious of it as having operated. A function of thought, in other words, is in itself a pure capacity or potentiality, the existence of which can only be revealed to us when, in relation to the material which it informs, it develops into actuality. The fact that people are unaware of the part played by intelligence in the combination and connexion of impressions, no more shows that intelligence is a pure blank than ignorance of the calculus on the part of the "majority of mankind," is a proof that the judgments of pure mathematics are untrue.

JOHN WATSON.

VI.—CRITICAL NOTICES.

An Introduction to the Philosophy of Religion. By JOHN CAIRD, D.D., Principal and Vice-Chancellor of the University of Glasgow, and one of Her Majesty's Chaplains for Scotland. Glasgow: Maclehose, 1880. Pp. 358.

THIS is, in many respects, a remarkable book; and perhaps the most important contribution to the subject with which it deals that has been made in recent years. Its substance was delivered in Edinburgh as the "Croall Lecture" for 1878-9, and it has been recast for publication in the form of a treatise. A strictly speculative work, it appeals to many who are unaccustomed to philosophy; and it is stimulating, in no ordinary degree, to the advocates of those philosophies which it attacks. In the literature of the subject to which Dr. Caird's book belongs, we meet with so much irrelevant and partisan discussion, that an able and fair-minded treatise, free from the rhetoric of the ordinary religious essay, is as welcome as it is rare. It is also refreshing to find a book enriched with the results of speculative study, and erudite in the best sense of the word, unencumbered with that display of learning which in similar works is sometimes thrust upon the reader's notice.

The real merit of the book, however, does not lie in the satisfactoriness of the results which Dr. Caird has reached, or of the philosophy which he champions; but in the intellectual breadth of the treatise, its happy suggestiveness, its elevated tone, and the general felicity of the speculative discussion. These portions may be appreciated most by those who are least able to assent to the philosophy.

In a preliminary chapter, the aim or function of Philosophy is stated, and sundry objections to the competency of Reason in the sphere of Religion are mentioned. Although the special ontological theory which the author advocates is discussed more fully in the eighth chapter, entitled "Transition to Speculative Idea of Religion," in this

first or introductory section the keynote of the book is struck—"The peculiar domain of philosophy is Absolute Truth".

"It does not confine itself to finite things, or content itself with observing and classifying physical phenomena, or with empirical generalisations as to the nature and life of man. Its vocation is to trace the presence and the organic movement or process of reason in nature, in the human mind, in all social institutions, in the history of nations, and in the progressive advancement of the world. In other words, so far from resting in what is finite and relative, the peculiar domain of philosophy is absolute truth. It offers to thought an escape from the narrow limits of our own individuality, even our own nationality and age, and an insight into that which is universally and objectively true."

In subsequent chapters, the objections to the competency of Reason in the sphere of Religion are dealt with in detail. In the first place, the limitation of human knowledge to the sphere of the relative and finite is discussed, with special reference to the doctrine of Mr. Herbert Spencer. Mr. Spencer's position is that to think is to condition, and that the sphere of the unconditioned is the sphere of the unthinkable; that a science of the Absolute is a contradiction in terms, because all thought is relative; but that, while the Absolute cannot be known, it remains an uneliminable datum of consciousness. In opposition to this, Dr. Caird maintains (1) that, if we only know the phenomenal, we can never know that it is phenomenal only; that in order to know that anything is limited we must in the first place traverse or transcend the limit; and therefore that we cannot know that we are ignorant of the Absolute, without in some sense knowing that of which we affirm our ignorance. Further (2), we cannot deny that we know the Absolute, and yet affirm on any rational ground that the Absolute exists; therefore the right conclusion from the doctrine of the relativity of knowledge, as taught by Mr. Spencer, is not that we cannot know the Absolute, but that the Absolute does not exist—that it is zero, or nonentity. The disability under which human reason is said to labour is not only chronic but constitutional, inherent in the very structure of the intellect, and nothing can possibly remove it. To talk of an external revelation removing it (as is implied in Mr. Mansel's development of the theory) is to talk at random, because according to the theory it is a native and necessary impotence, and the human faculties cannot even attest the existence of the source whence the revelation comes. If, in short, all existence is relative, then of the Absolute we can predicate nothing. (3) The notion of an absolute absolved from all relations is a fiction of the imagination. The absolute is known *with* the relative, the object *with* the subject, just as the circle implies the circumference, and the north pole the south. If we separate the absolute from the relative, the object from the subject, we have nonentity or zero. Much exists beyond individual consciousness, but nothing exists beyond all consciousness. All objective reality presupposes thought or intelligence; and things have reality for us only in so far as they are thinkable realities. We find rationality in nature. This is the tacit presupposition of science. We find it also in man. And when we ascend above nature and

man, we do not sink into an abyss of inscrutability, but ascend to intellectual unity. We apprehend the ultimate "unity of thought and being" unfolding itself to finite intelligence; because it is "the very nature" of the Absolute "to realise itself in the thought and self-consciousness of finite intelligence". (4) We cannot worship the unknowable. "Awe, reverence, humility" are "not legitimately due to such an object". We cannot revere a divinity that is "the apotheosis of ignorance". A religion that is wholly mysterious is as absurd as a religion that is not mysterious at all. The first step by which thought rises to the knowledge of God may be said to be the negation of the finite, the feeling of the evanescence of the world; but this is only the prelude to the recognition of the real Infinite, which reveals and realises itself within the finite. It is because the infinite intelligence is "essentially the same with my one, though far excelling mine in range and power" that I am led to reverence it.

In a short note appended to this chapter, Dr. Caird deals more in detail with Mr. Spencer's doctrine that we may have "a positive though vague consciousness of the Infinite, as that which transcends distinct consciousness". To this Dr. Caird replies (1) that the Infinite must be either thinkable or unthinkable, either therefore a positive object of thought, or no object of thought at all; (2) that Mr. Spencer confounds the unimaginable with the unthinkable; and (3) that as to the bare category of "Being" which remains after thinking away all its characteristics or qualities, "take it for what it is, we know all about it that there is to be known". To the last of these three points Mr. Spencer might perhaps rejoin that it is much the same as saying we know nothing at all about it. (But it may be better to defer our criticism till a later stage of the argument is reached.)

In his next chapter, Dr. Caird discusses the doctrine of Intuition. He tells us that "religion escapes the grasp of philosophy, if it be affirmed that we have an intuition or intuitive knowledge of its object". The "pretensions of intuition" are in this chapter specially condemned. Intuitionalists will doubtless reply that the doctrine of intuition or immediate knowledge is not clearly distinguished from that of rational apprehension; and, in so far as it is distinguished, it is a distinction without a difference, a verbal and not a real contrast. The philosophy which recognises "fundamental principles of cognition," or "primary beliefs," is described as a philosophy which "denies the jurisdiction of reason"; but no attempt is made to show how it does so. Nay, the proposition "we believe in God because we know Him" is contrasted with "rational apprehension," and disparaged. It is even said that the aim of the philosophy of intuition is "to silence reason". This is surely to misconstrue the doctrine in question. No intuitionalist worth arguing with abjures or silences reason. He does not even contend for a "knowledge above reason". His intuition is itself a rational apprehension, of which no further explanation can be given; and which is therefore fundamentally, or in the last analysis, mysterious. To represent this as "an attitude of

uncritical certitude," to speak of it as "simple faith," or "the revolt of faith against reason," is to do as signal an injustice to it, as it would be to describe the opposite doctrine, defended in these lectures, as one that refused to acknowledge any ultimate mystery in the universe.

The "rational or philosophic knowledge of God" is described as not immediate, but "mediated". Many will be of opinion that the immediate and direct knowledge of an object is more satisfactory than any knowledge of it that is mediated and indirect; but Dr. Caird has endeavoured to find out the source to which the tendency to rest in immediate knowledge may be traced. He finds that the objections to a mediated knowledge are due (1) to a misapprehension of the function of reason in religion. "Thought or reason" is said to be present as "an underlying element" in religion. But surely, in that case, the immediate intuition which is criticised is not "irrational". If our thought is at first unconscious and uncritical, and we afterwards "turn back to reflect on the significance of its creations, and read into them their rational meaning" (p. 46), that will not prove the intuitional theory of knowledge to be illusory, but rather the reverse. It only amounts to this, that the intuitive and the reflective are two "stages" through which human thought passes; and that, as Principal Caird himself afterwards puts it, "immediate and mediate thought are not rivals". (2) The second objection to mediated knowledge is that it is "narrower and more abstract than intuition". Here it is easily shewn by our author that there is the surface feeling of unity, an elementary and uncritical apprehension of it, which precedes the rational knowledge of unity; and that the latter is "a unity of principle discovered when opposing elements have been reconciled". We "substitute, for the crude unities of popular observation, the real and profounder unities of thought" (p. 49). But wherein is this "final synthesis," by which Thought "reconstructs the reasoned unity of the world" (p. 50), superior to the first apprehension of the Infinite by the intuition which is dishonoured in contrast? We may distinguish certain stages or phases in the apprehension of the fundamental unity of things. There is the instinctive feeling or imaginative surmise of unity, excited in the mind of the poet by the order and harmony of the world. There is the perception of the unity of law arising out of the generalisations of science; and there is the speculative conviction of the fundamental unity of all things. But each of these may be construed as a phase of one and the same intuition. Is the "thought" to which Dr. Caird refers as "reconstructing the unity of the world," direct and immediate thought? Then the polemic against intuition is invalid. Is it "mediated" thought? Then by what is it mediated? Not by itself. By what extrinsic element then is it mediated? And does not the fact of its being mediated destroy its intellectual primacy, and degrade it to a secondary place? It is said to be the high prerogative of "thought" to reconcile the antithesis of things; but if the reconciliation does not lie in the very nature of the things themselves, independent of any thought regarding them, it cannot exist anywhere. The sole need of the reconciliation is due to

the inadequacy and poverty of human "thought". Instead therefore of glorifying Thought as the reconciler, it may rather be considered as the intuitive discerner and recogniser of a prior reconciliation which exists in the very nature of things themselves. We are not told, in this part of the book, to what the "final synthesis" of thought amounts, or how it enables us to reach the firm ground of objective and eternal truth. But we are told, in answer to a third objection, that it is "knowledge which concludes to God by the mediation of some other idea"; and that all the objections to such a mediated knowledge tell equally against the immediate knowledge of Him, if the separateness of the two natures be retained; because all knowledge implies "a conscious relation between the knower and the object known". But then the "process of mediation," by which we are assured that we are able to know the Divine Nature, is described as one "which is *contained within that Nature itself*"; and a "philosophy of religion" is described (p. 52) as "simply a conscious development of the process by which the finite spirit loses its finitude"; while *our* rational "knowledge of God is, in another point of view, God's knowledge of Himself". Is not this to destroy the individuality of the finite, absorbing it altogether in the infinite?

In Dr. Caird's criticism of the "validity of intuition or immediate knowledge as the ultimate basis of certitude," an advocate of the doctrine condemned might complain of some misapprehension of his real position. Criticism is so inwoven into the statement of the doctrine to be criticised that it does not appear at its best. Thus, the "fundamental position of the intuitional school" is said to be that "any thought, or sentiment, or notion, which I find in my mind, and of which I can give no other explanation or reason, must be regarded as absolute truth" (p. 56). No intuitionalist would recognise his doctrine in this description of it. It would be quite as correct to describe it as the glorification of chance, or as a doctrine of the haphazard. It is, however, shortly afterwards redescribed more satisfactorily thus,—"that there is, and must be, beyond all derivative knowledge, certain underived ideas as to what is true and right, which I must accept as their own authentication" (p. 56). In criticising it, as thus defined, Dr. Caird says (1) that "the immediate may not be the underived," which is evident enough, and is admitted on both sides. He says (2) that the "certainty of immediate conviction is purely empirical," which is by no means evident, but altogether the reverse. Doubtless many notions which occur to the mind with an air of spontaneity or self-evidence, turn out to be only "unwarrantable popular assumptions". Arbitrary association, habit, usage, &c., lead the majority of men to interpret their prejudices as intuitions, and it is one of the functions of the intellect to test all alleged intuitions, to let the light of the pure reason and of experience play around them, and finally either to verify or to reject them. Consciousness remains the final court of appeal; but it is consciousness purified, tested, strengthened by thought, and by other things besides thought. But if the "certainty of immediate conviction is purely empirical," does it

fare any better with the "certainty of rational thought"? How does "thought" carry us out of the sphere of contingency into that of necessity, when "immediate conviction" cannot do so? The root of the error lies in the separation of "rational thought" and "immediate knowledge" by an artificial wall or barrier.

Dr. Caird is of opinion that a satisfactory answer is given by those who deny the validity of intuitions, when they say that they do not themselves possess them. But may not the authority and validity of the reason, which he puts in the place of intuition, be similarly questioned and denied? If any one alleges that he has no intuition of the infinite, doubtless you cannot argue with him by appealing to that intuition; but if he says that reason in him does not attest what Dr. Caird says it attests, his position is no better. Experience shows that a proposition which is perfectly luminous to one man, and which may seem evidenced to him by "the light of the pure reason," is absolutely the reverse to many others. Our author says that there are no intuitions attested by the universal consciousness of the race, no two ages in which the same beliefs prevail, and that if we could find anything common to all the ages, it would be "an abstraction which would embrace under a common head the rudest fetishism and the spiritual theism of christianity". It is a misconstruction of the intuitionalist doctrine to represent it as requiring an absolutely uniform attestation throughout the ages; but intuitionalists find no difficulty in discovering a common element which is much more than "an abstraction," in all the stages of human thought and experience. These stages constitute an organic whole, bound together by the subtlest intermediate links of progressive evolution; and it does not follow that the intellectual outcome of an intuition, fundamentally the same in all the stages of its progress, should be a series of absolutely identical utterances; any more than that the beliefs of an individual should always remain the same, if he continues the same individual. Nay, if the outcome of the same intuition differs, and *must differ*, in each individual, the variety which is characteristic of it throughout the ages is a simple development of that necessary difference. On the other hand, as already remarked, the identity which is missed in the case of "intuition," is not found in "thought" or "reason," which is put in its place.

In a subsequent chapter, Dr. Caird says that "universal truths are not truths about which all men agree"; and that it is not "that which is common to barbarism and civilisation, which is most truly human, but precisely that in which civilisation differs from barbarism" (p. 82). "There is not a single idea in the highest religion which remains what it was in those which preceded it. The perfect organism while it comprehends and absorbs, at the same time annuls and transmutes all that pertains to the earlier and imperfect stages of its life." Now, intuitionalists could scarcely wish a better statement of the case, from *their* point of view. It is manifest that an exhibition of the stages, through which the human race has passed in the progress of its civilisation, will not determine the question at issue between the

rival schools. It does not touch the question. Statistics and genealogical tables are of no greater service than hypotheses as to the prehistoric. The fact of development and evolution is a fact signalised on both sides; but there is no evidence to show that the stage of intuitive apprehension passes into and is *absorbed in* that of rational insight.

Dr. Caird's third chapter is a criticism of the objections to a philosophy of religion, founded on religion being a positive revelation; while the fourth chapter discusses the necessity of religion. In this latter it is the writer's aim to show, not only that the human mind may, but that it *must* rise to the knowledge of God. He had previously hinted that between Intuitionalism (which reduces our moral and religious ideas "to the level of blind and irrational prejudice"), and Experientialism (which makes them "a mere product of association"), there is an intermediate and more excellent way, *viz.*, that of Rationalism (which shows that they are "necessary moments of that organic whole, that eternal order and system, of which universal truth consists, and which is only another name for Him who is at once the beginning and the end, the source and the consummation of all thought and being") (p. 63). But in order to prove that the human mind *must* make the theistic inference, it has to be shown that "finite knowledge, as finite, is illusory and false; and that all true knowledge contains in it an absolute and infinite element" (p. 86).

This leads to a critical investigation of materialistic theories. Their inadequacy is said to be twofold. (1) Proposing to exclude mind, they really presuppose it. They assume it in the action of physical force, which is in reality a creation of mind. (2) The conception of mechanical force, which is their "master-key" to the universe, is applicable only to inorganic nature, and not to vital phenomena and to consciousness. (It may not be an irrelevant criticism to say that if the former of these replies is correct, the latter is superfluous. If thought or intelligence lies within or behind the concept of physical force, this thought or intelligence is surely all that is needed to explain the higher organised existences and the phenomena of consciousness.) But leaving the sphere of mechanical causation, we find in the organic and vital sphere (1) system or systematic unity, not mere fragments aggregated, but a living coherent whole; (2) a unity that is self-developed and self-sustained, the productive cause of the unity living on in its effects; and (3) an objective unity, beyond the observer, the chasm between the two being easily traversed by thought. If, therefore, we find in matter the promise of mind, it is because mind is already working in matter, because we think of matter as "containing in it virtually all that mind is" (p. 117); and this is "a view of the world which spiritualises matter rather than materialises mind". The accuracy of this criticism of materialism will be conceded by many who doubt whether it warrants a theistic inference, and who cannot follow the author in the next step of his argument. It may be that thought is seen in Nature—and that is, in other words, to say that there are laws of Nature, or that Nature is intelligible—but the

thought thus recognised in material things, because they are known by the mind, supplies us with a singularly attenuated type of theism. Hence, it is not enough to show that "thought is the *prius* of all things," unless we can also show that this thought is "universal and absolute".

Dr. Caird maintains that in self-consciousness "there is already involved a virtual and potential infinitude" (p. 120). We are limited only by that which is one with ourselves; whereas physical Nature is limited by that which is opposed to itself. The individuality of every separate "thing" in Nature is an individuality which is shut up within itself, and which asserts itself against all that is without or beyond itself. The individuality of "a spiritual intelligent being" is not thus shut up and isolated. On the contrary, it finds "the measure and the value of its own life" in a "growing participation" in the life of Nature and of other spiritual beings. We see ourselves in Nature. Our finitude "returns upon us in the sense of a limit which is being continually removed, only to be continually replaced" (p. 124); and in the distinction between the actual which we are, and the ideal after which we aspire, we presuppose "an identity that is beyond the distinction". Is this a legitimate inference? We cannot see it. The consciousness of our imperfection neither proves that the imperfection will ever be removed, nor that there is a perfect being anywhere in the universe, though it may *suggest* both of these conclusions.

But the same result is said to be reached in the doctrine that the knowledge of a limit implies the transcendance of the limit. It is supposed that we know the finite and the infinite *together*, just as we know self and not-self. In one sense it is evident enough that our knowledge of a limit proves that the boundary has another side than that which fronts us, a side turned the other way; but that this implies that we have transcended or can transcend the limit is no more obvious than is the assertion that we are ourselves illimitable. It is affirmed by Hegel and the Hegelian school, that our individual self-consciousness involves within it an infinite self-consciousness, that the self-consciousness of the individual is a moment or a momentary phase of the self consciousness of the Infinite. If so, the unity which reveals the diversity is the unity of the Infinite, expressing itself in the successive phases of finite existence; and strictly speaking no consciousness is individual; all consciousness is the phenomenal manifestation of the Infinite and Absolute Self-consciousness. According to Hegel, the consciousness of the finite is, by itself, illusory; and the consciousness of the Infinite is also, by itself, illusory; but the one becomes real in and through the other. That is to say, the addition of two things, each in itself unreal and illusive, lifts them both out of the category of the illusive, and makes them real. But to this consciousness gives no reliable attestation. There is nothing to warrant the assertion that the finite can only know itself in the Infinite, and that the Infinite can only realise itself in the finite. If my individual consciousness is not reliable as individual or finite,

how can its reliability be guaranteed, when it affirms anything as to the Infinite?

To affirm that, in being conscious of a limit, the limit itself disappears, is either to use the term "limit" at the same time in two different senses, or simultaneously to affirm and deny the same thing. There never was any limit, if it can vanish in the very act by which it is known, if it can be transcended in the very experience by which it is realised. This has been skilfully stated by Professor Veitch in the last section of his Introduction to *The Method, &c., of Descartes.* I can easily transcend the limit of one act of consciousness by enlarging its imaginative area, so to speak, in a second act of consciousness; but this second act remains limited by a further similar area. It is in the first act, therefore, that the transcendance must lie, if it lies anywhere. In short, the act must transcend itself; but, in that case, it is manifestly *felo de se.* Neither in the case of transcending the limit of visual perception, nor in transcending the sphere of a desire or that of an abstract notion, is the limit abolished by our being conscious of it. It is quite true that we know opposites in correlation, self and not-self, mind and matter, light and darkness, &c.; but their differences are not abolished in unity, because we know them thus. As Professor Veitch observes, "the moment correlatives are identified, the correlation ceases;" and, with such a doctrine as the basis of our theory of knowledge, its entire fabric disappears in a series of dissolving views.

We are told that to be conscious of the dualism of mind and matter is to transcend the dualism in a higher unity of thought. How is it transcended? Surely the two notions stand fast in their original antithesis, while they are realised as the opposite phases of a single abiding reality. If they were absolutely identified, if the dualism disappeared, our knowledge itself would disappear.

The boundaries of our knowledge are its least important features. It is its positive and not its negative characteristics that are primary. What it is, is of greater significance than what it is not.

It is said that finite consciousness implies and carries with it the Infinite, just as the notion of finite space implies and carries with it the notion of infinite space. But there is no analogy in this. We are not conscious of an infinite personality as we are conscious of the finite. They are not correlates. We cannot even intelligibly construe to thought the notion of consciousness as infinitely diffused throughout the universe. On what grounds therefore do we infer the existence of a universally diffused consciousness which pervades the universe, and realises itself in the life and consciousness of individual beings? How can we grasp in a single conception our own finite individuality and this all-pervading, everywhere diffused individuality? The Infinite, *as thus construed*, must suppress or extinguish finite individuality. If the finite in itself be mere illusion (as the negation of the Infinite), and if the Infinite in itself be illusion (as the negation of the finite); and if, nevertheless, the Infinite can only realise itself in the finite, evolve and manifest itself thus; and if, further, this is a

process of perpetual development, never wholly realised or completed, the philosophy which affirms it is fundamentally phenomenal, as well as necessitarian. We have process without product, and process inexorably determined by the necessities of evolution.

Principal Caird has worked out the central idea of his book most fully in the eighth chapter, which is entitled "Transition to the Speculative Idea of Religion". In the previous chapter he had very felicitously shown the inadequacy of religious knowledge, in its ordinary or unscientific form, as being (1) metaphoric or pictorial, (2) fragmentary and abstract, and (3) self-contradictory. Here, as in the rest of this treatise, the destructive section is better than the constructive. Dealing now with the idea of unity, he finds that its real nature is not to be discovered by the logical understanding. It cannot be grasped by affirming that there is a common property underneath diverse qualities. It is only reached when we perceive that true unity shows itself *in* diversity. Further, thought can apprehend a unity that is universal, and is universally immanent in things (not an abstraction *from* them); a unity, moreover, which shows itself in a process of development or ceaseless modification of that which is, and which at the same time incessantly returns upon itself; in other words, it advances by way of affirmation, negation, and reaffirmation. In this eighth chapter, we find the Hegelian ontology "inveterately convolved" with another philosophy of evolution, which may be maintained while the doctrine of Hegel is dropped. Thus, it is said, we escape from materialism and from idealism alike, by recognising that neither Nature on the one hand nor Mind on the other is an isolated existence, each independent of the other; but that they are both members of an organic unity. "As Nature is realised Mind, so Mind finds itself in Nature." "Nature is not the bare antithesis, but the reflection of Mind; and Mind discerns itself in Nature, *tanquam in speculo*" (p. 239). What is affirmed in these two sentences is common to the Hegelian and to many other philosophies; but when Dr. Caird goes on to assert that the true Infinite is the organic union of the infinite and the finite; and therefore that, on the one hand, the finite spirit presupposes the Infinite and, on the other, the Infinite contains organic relations to the finite, we find ourselves in a totally different region of thought; and the conclusion to which we are led is not validly deduced from the premisses with which we started. If the true Infinite be defined as the organic union of the Infinite and the finite, the term "infinite," twice used in the definition, must be used in a totally different sense in the two cases. We are carried into cloudland in the assertion that our individual consciousness rests upon a *universal* self-consciousness, the objective reality of which is guaranteed to us by itself. It is said that, in thinking our own individual consciousness and the outward world, we "at the same time presuppose a higher, wider consciousness which underlies them". How so? I may be unable to conceive of the world existing apart from, or outside of, thought (in as much as I cannot get quit of thought of some kind in performing the supposed

act of thinking it away); but that will not prove the real and objective existence of an infinite Intelligence; it will merely prove the imperfection of my faculties.

It is affirmed that the individual can "cease to think his own thoughts"; and that, by so doing, he "gains himself". Conversely, it is maintained that the Infinite does not suppress or abolish the finite, but presupposes it, and is only intelligible in the light of it. "The idea of God contains *in itself*, as a necessary element of it, the existence of finite spirits" (p. 252). He is not self-contained in his own being; but in Him is included all that of which the finite world is the manifestation. God "manifests Himself in the differences of the finite world, and in those differences returns upon and realises Himself". "The knower is also the known," "the knowing subject becomes object to itself" (p. 255). The eternity and the eternal necessity both of matter and of mind is virtually implied in the doctrine here announced. There may be valid grounds for maintaining both of these positions. The eternity of matter and the pre-existence of mind may be philosophically the most tenable of hypotheses; but they are *necessary* elements in the philosophy of religion here unfolded.

Dr. Caird's criticism of the proofs of the existence of God, and his discussion of the relations of morality to religion, and of the philosophy to the history of religion, are specially interesting and able. In the former section we naturally find the ontological argument of Anselm, Descartes, and Hegel preferred to other modes of proof; but it is unnecessary to epitomise the argument.

If in this remarkable treatise, the Principal of the University of Glasgow has not succeeded in solving the problem proposed for discussion, he has written a remarkably significant book, which will rank with the best that exist upon the subject. Probably our British theological literature contains no abler or more suggestive volume. Its true value will be recognised, not by the assent which it commands—that is the secondary merit of commonplace books, and the "common-sense" solutions of secondary men—but by the amount of discussion which it evokes, and the attention which it directs to forgotten aspects of the problem with which it deals.

It is a signal benefit to the progress of the race that stress should be laid from time to time on separate sides or aspects of this question. Philosophic progress is secured, not by the prolonged supremacy of any one school, but by the ultimate rise and fall of opposite systems; and no better proof could be given of the vitality of speculation in Scotland than the existence of a distinct and well-defined Hegelian school within the University of Glasgow. The special interest which the higher Metaphysic has for the Scottish mind, and the close connexion between its problems and those of Religion, were never more happily illustrated than in these Lectures of Principal Caird's.

William Knight.

Man's Moral Nature. An Essay. By Richard Maurice Bucke, M.D., Medical Superintendent of the Asylum for the Insane, London, Ontario. London: Trübner & Co., Ludgate Hill, 1879.

The chief object of this essay is to consider the physical seat of our active, moral or emotional nature; or all that part of the mind not expressed by intellect. Instead of fastening on some portion of the brain for this purpose, the author makes choice of the Sympathetic System of nerves.

The moral nature is analysed into the four states denominated love, faith, hate, fear: a positive couple (love, faith) and a negative couple (hate, fear). These are incapable of being farther analysed; and to them all moral or emotional states are to be referred. The author, however, does not occupy much space with the resolution of our various compound emotions. He regards joy, high spirits, exultation, enthusiasm, and triumph as love and faith in their original non-differentiated form, combined with a more or less compound concept. Grief in a mother for the loss of her child is love combined with the concept death, which concept is farther combined with the moral state, fear. Sadness, low spirits, depression, dejection and despair are compounds of hate and fear in varying proportions, and combined or not with concepts. The fear of death is a remarkable case of inherited association. It would be found advantageous as a preservative of life; and the people that had it strongest would live where others could not. It would tend to become stronger and stronger until such time as the family affections and the sense of duty and religion took its place, at which time people would be ready to devote themselves for a good cause.

The final drift of the book is stated to be, not simply the determination of a peculiar mental and physical coincidence, but the question—Does the central fact of the universe, as it stands related to us, justify on our part fear and hate, or love and faith, or does it justify neither? The answer is to be that it justifies love and faith.

We are first to see the proofs of the thesis that is to connect the moral nature with the sympathetic nerves and ganglia. After tracing minutely the distribution of these nerves, the author asks—Does the sympathetic possess motor functions? The answer is that it is the source of motion to unstriped muscle. Next is it sensory? The reply is negative. The third question is—Does the great sympathetic exercise a controlling influence over the functions of the secreting glands? There can be no doubt that it does, and is the main centre of such control. In cases where these glands have a supply of cerebro-spinal nerves, it is found that the glands are exposed to external injury, as is the case with the salivary and mammary glands, and such nerves have a purely protecting function. The fourth question is—Does the sympathetic influence the general nutrition of the body, and in what manner? Now, although the nutritive processes are a result of chemico-vital selection and cell growth and destruction, it may be affirmed that they are subject to a general supervision of the

great sympathetic system. These four questions are preparatory to the fifth and last. Is the sympathetic the nervous centre of the moral nature? This is answered in the affirmative, for the following reasons:—

1. By common consent, as shown in all languages, our emotions have their seat, not in our heads, but in our bodies. 2. In woman, as compared with man, the intellect is less developed, and the moral nature more developed; while we know that the brain is smaller, and have reason to think the sympathetic system larger; at all events, it is wanted for the two additional organs—the mammæ and the uterus. 3. The functions of the sympathetic are *continuous* functions; those of the cerebro-spinal system *instantaneous* and intermittent functions. Now our emotions are continuous, while our thoughts die out and are renewed. 4. The sympathetic is deep-seated; the other system is in connexion with the outer world. In connexion with this contrast, our emotions arise spontaneously from within and are comparatively difficult to express, while the intellectual states are easily expressed. 5. Moral states are simple, as compared with concepts: love is elementary and homogeneous; the concept 'child' is comprised of hundreds of simpler concepts. Hence for emotions a simple nervous system is enough; for intellect, we need all the complexity of the brain. 6. Moral states have a wide range of intensity; intellectual images, although more vivid at some times than at others, have no true range of degrees of intensity. Now the functions of the sympathetic differ chiefly in degree; the flow of moisture in the eyeball knows no other difference but amount. 7. The development of the moral nature is concurrent with large bodies; while great intellects are often found in small bodies. Religious founders and great artists have been men of good height and weight; moral idiots, as far as the author's experience has gone, are often very small men. 8. Other things being equal, the best and highest natures live the longest, showing the highest perfection of the nutritive system, and, by inference, of the sympathetic. The author devotes many pages of statistics to establish this allegation. The force of the argument, however, is weakened by his own admission that the nutritive power is the result of chemical and vital selection and cell growth, with merely a certain indefinable amount of control from the sympathetic system. The statistics relied upon comprehend, first, the Jews; second, persons of eminence as given in a Cyclopedia of Biography; third, married persons, who may be presumed to be more emotional than celibates; and, fourth, women as such.

The author then adduces numerous physiological and pathological considerations in support of his thesis. He looks upon the great emotional activity of childhood and youth as a testimony in his favour. There is no unusual cerebro-spinal activity at that period, but rather the contrary; the sensory-motor tract may be in full operation, but it is in connexion with the sympathetic centres, the centres that govern exclusively the emotional outbursts.

The extraordinary mental depression from diseases of the viscera is

garded as due to the sympathetic system, on which the viscera are ependent for their chief supply of nerves. Addison's disease of the upra-renal gland is a strong case in point; the organ is supplied with n extraordinary number of sympathetic nerves, and the mental epression of the sufferer from the disease is of an extreme kind.

Speaking of the emotional aspects of the senses, the author thinks hat hearing is especially an emotional sense, and is so in consequence of ts numerous connexions with sympathetic ganglia. Moreover, sounds dmit of nearly the same differences as emotion proper—differences in ontinuity, rhythm and range of intensity.

Again as to the expression of emotion, the author, repeating the usual facts as to the influence of joy, grief, &c. on the heart, digestion, nd spasmodic movements, attributes the whole to the influence of the ympathetic centres.

The question as to the precise physical seat of emotion is still an open one; and while Dr. Bucke puts a number of the facts in a new and suggestive light, yet in reaching his peculiar conclusion he makes many precarious leaps. His psychological analysis of the so-called moral nature seems to me to be retrograde; the elements assigned by him do not exhaust the component parts, nor are they precise in themselves. "Faith" is a most equivocal word, although playing a large part in the scheme of his book, as the equivalent of religion. "Hate" he couples with "fear" as a negative state; yet the reasons are very different; hate is a positive passion, although its outgoings come into conflict with those of love; while fear is a negative in the sense of weakness or absence of other powers. Moreover, at this time of the day, I should have thought a ternary division of the mind—action, emotion and intellect—the only one at all tenable.

Dr. Bucke appears to make light of the commonly received view that localises all conscious states whatever in the hemispheres of the brain. It is a curious problem, for which an *experimentum crucis* is still wanting, whether the emotions have specialised cerebral centres, or whether they are associated with the tracks of ideas. I should think the second hypothesis most likely. Nevertheless, the emotional outbursts demand the concurrence of organs outside the brain, such as the viscera with their nerves—both spinal and sympathetic; and consequently have these organs for a condition of their existence, but not necessarily the sole condition.

There is a tendency all through the work to treat as one and the same fact mere animal spirits—the adjunct of healthy nutrition—and emotion strictly so called, as love or anger. This appears to confound instead of elucidating the great problem of the physical and mental. There is also something very loose in treating mere corporeal bulk as a proof of good nutrition, and of a consequent pre-eminence in moral endowment as a whole. We are all aware of Cæsar's dislike to the lean and "dangerous" Cassius, but we are also perfectly familiar with the other conjunction; and statistics has not yet assigned the relative proportion of the two couplings.

A considerable portion of the present work is devoted to an inquiry into the moral progress of mankind, to which the theory above sketched is made instrumental. However we may agree or disagree with the author's views, we always find his expression clear and interesting; and whoever begins the work will be certain to finish it.

A. Bain.

A Student's Handbook of Psychology and Ethics. Designed chiefly for the London B.A. and B.Sc. By F. Ryland, M.A., late Scholar of St. John's College, Cambridge. London: Sonnenschein & Allen, 1880. Pp. viii., 173.

In his Preface, Mr. Ryland defines the aim and scope of his work. The intention has been to provide for examination-purposes a selection of the salient doctrines of Professor Bain's compendium of *Mental and Moral Science*, and to supplement this by quotations or abridged statements from other works which appear to have been consulted by London University examiners in drawing up questions for the Pass Degrees of B.A. and B.Sc. As the aim of the compiler has been "exclusively practical," no discussion of doctrines is undertaken, and accordingly passages from psychological works of the most diverse character are presented indiscriminately for the instruction of the student. Hamilton, Spencer, Sidgwick, Lewes, Calderwood, are drawn upon in turn for scraps which may be utilised by the candidate when he has to face questions implying "a wider range of reading" than *Mental and Moral Science.* A body of references to various writings, and a selection of questions from the examination-papers of the last half-dozen years at London are appended.

An elementary manual of Psychology and Ethics is a work which must make great demands upon the writer. The complexity of the facts is in itself so great, the field of investigation is so wide and so ill-defined, the possibilities of misconception on the part of the student are so numerous, that the most careful and judicious treatment is absolutely requisite if serious harm is not to result from the attempt at conveying elementary instruction. So far as one can judge, this *Manual* does not make the slightest effort to escape even the most apparent pitfalls in the way of the student. Doctrines fundamentally opposed are thrown before the learner without a word as to the deep significance of their differences; the selection of the said doctrines seems to have been determined solely by reference to the examination-questions of the last few years—for in the main the paragraphs going beyond *Mental and Moral Science* contain concise answers to some of these questions; and even the statements of elementary facts are disfigured by carelessness and inaccuracy. The subject of the Senses is one which may be treated successfully if it be strictly guarded, and if the teacher carefully keeps before his students the lines of separation between psychology and physiology on the one hand, and between psychology and theory of knowledge or metaphysics on the other.

Mr. Ryland is entirely neglectful of these precautions, and I can conceive nothing more fatal to the progress of the student than contact with the loose unguarded statements given in this work, *e.g.*, on pp. 22, 23, 36, 42.

The book is so essentially and avowedly a product of the London University examination-system, it is so entirely a piece of *cram* work, that any serious criticism of it is quite out of place, but I feel sure that all who have had experience in teaching elementary psychology will agree in thinking that nothing could be more injurious to the student of philosophy than the attempt to make use of such a compilation.

R. Adamson.

An Introduction to Logic. By W. H. S. Monck, M.A., Professor of Moral Philosophy in the University of Dublin. Dublin University Press Series. Dublin: Hodges; London: Longmans, 1880. Pp. xvi., 259.

Professor Monck's *Introduction to Logic* consists of two quite distinct portions. The first, and smaller, (pp. 1-89), is a brief and lucid elementary statement of the ordinary logical doctrines; the second, and more important, contains a series of discussions of various questions, partly of logical theory, partly of logical praxis. The several chapters in the second division of the work deal with logical questions in a manner appropriate to a university class in the subject, and appear as though they had formed portions of university lectures. Perhaps from this cause they are somewhat fragmentary, and include matters which might with advantage have been omitted from a treatise intended for publication. Of the practical discussions the most interesting are the treatment of Indirect Proof or *Reductio per impossibile*, and the solution of some of the more famous logical puzzles. As bearing on the theory of logic, the most important chapters are those which deal with the definition of the subject, with the famous distinction between analytical and synthetical judgments, and with Sir W. Hamilton's proposed modifications of the doctrine of judgment and syllogism. With reference to this last problem, the author rightly brings into prominence the essential difference between the collective or numerical and the distributive senses of the quantitative symbols employed in logical expressions, and has little difficulty in shewing that Hamilton proceeds entirely on the assumption that the said symbols have only a collective significance. It is evident that on all these questions, and on others but partially treated by the author, such as the import of terms and propositions, the legitimacy of induction as a form of reasoning, the true function of syllogism in relation to proof, the ultimate decision rests not with formal logic as conceived by the Hamiltonians or by the author himself, but with the more general doctrine which we may call the Theory of Knowledge. The main defect of Professor Monck's work, it seems to me, is the uncertain position of logic as there treated with regard to this general theory

of knowledge. While Professor Monck is compelled on all the cardinal points to have recourse to considerations lying outside the scope of logic even as described by himself, the discussions are not carried to their full extent, nor is the relation of logic to theory of knowledge, the most interesting question in the present condition of the subject, handled in a satisfactory manner.

R. Adamson.

VII—NOTES AND DISCUSSIONS.

MR. GALTON'S STATISTICS OF MENTAL IMAGERY.

Mr. Galton's laborious and interesting observations on Mental Imagery[1] contain many results in accordance with our previous theoretical knowledge of the mind, and some that appear startling and paradoxical. I mean to comment at large on these results; but, before doing so, I wish to make a few remarks upon the methods pursued.

It is a laudable object of ambition to extend to the human mind the methods of the physical sciences—Observation, Experiment, and Induction. The researches hitherto conducted on this plan have principally had reference to the Senses; in every one of which we have derived a considerable body of accurate information, not solely confined to the physiology of the organs, but extending to the subjective or mental functions. The experimenter in this walk has always one foot in the object-world; he views subject-states in their rigid concomitance with well-defined variations in the sensory functions, or with definite impressions from outward agents.

Yet even in the actuality of sensation, we encounter the special difficulties of the delineation of subject-states. In the more intellectual sensations of touch, hearing, and sight, we can give precise descriptions, and come to some sort of mutual understanding; as, for example, in plural contacts in touch, in pitch and intensity of sound, in colour and form of visible image. But the purely emotional feelings, those of pleasure and pain, are without definite measure or the means of a common understanding between two observers. There are ways of abating, but not, I conceive, of ever entirely overcoming, this difficulty. It would take a good deal of mutual comparison of experiences to enable me to say whether my sensation of the sweetness of honey or of the malodorousness of assafœtida was the same as another person's.

In passing from the sensation to the Idea, all our difficulties are increased. We are no longer sailing along the shore of the material

[1] See more especially Mind XIX. and the *Fortnightly Review* for September.

organism; we are in the ocean of pure mind, with only a hypothetical reference to the physical workings. If it be hard to estimate the value of sensation as felt by another party, it is ten times harder to estimate the value of the ideal trace or mental representation of a sensation. But, as in the actual, the case is easier for the intellectual sensations—those that have form and features, like a visible picture; the ideal feelings corresponding to the pleasurable and painful sensations are much more vague in their estimate than the actual.

The great problem of the Intellectual Powers is the IDEA, its marks, peculiarities and modes, its rise and fall, its enchainment in series, and so on. We cannot be too anxious to discover means of giving it precise expression and definition, taking care not to affect a precision beyond what the case admits of.

The rule being that the Idea is inferior in every way to the actuality, what we want is to be able to state in words the degree of inferiority. Now the idea of an intellectual sensation can be compared with the original, first, in fulness of lineaments or detail, second, in vividness (for sight, "brightness"), third, in easy self-sustaining persistence. The best test of all is the first; in proportion as the details of the original are represented in the picture, is the mental goodness or merit of that picture. I have little doubt, however, that this vital peculiarity will carry with it a corresponding measure of the others; the same mental tenacity that suffices for one will presumably suffice for all.

In ascertaining the quality of another person's mind in respect of the strength of some one class of ideas, as of sight, there are various indications within reach. As memory in any walk can be tested by the individual's power of verbal or other mode of reproduction, the recollection of a visible scene may be proved by the ability to describe it, or to make a picture of it. Or we may directly appeal to the person's self-consciousness to inform us of the character of the image as conceived, by a comparison with the actuality. Mr. Galton has chosen the last method in collecting his statistics.

Before remarking upon the results attained in this way, I must endeavour to characterise the drift of the inquiry. At first blush it seems to be nothing more than a determination, by accurate statistics, of the relative preponderance of certain varieties of mind that we already know to exist. If this were all, it could scarcely be called a psychological research; it would not discover, elucidate, or prove any psychological laws, any more than a statistics of the relative heights, or weights of Englishmen, would give us new psychological insight. Mr. Galton, however, seems at times to regard his observations as bearing upon the advancement of the Science of Psychology. Now, undoubtedly, they might do so, if he were to enlarge their compass somewhat, as I shall endeavour to show.

That certain individuals, A, B, C, have a great or a small visualising memory, is an important fact as regards them; it determines their aptitude or inaptitude for certain vocations, involving the energetic display of this faculty. It contributes nothing new to science; the

existence of such variations has been known at all times. Could we, however, devise an easier and more precise mode of ascertaining and expressing this aptitude, we should do a great work, whose outgoings would be both practical and scientific. Farther, if we applied a satisfactory method of measurement to large numbers, representative of entire populations, we should gain a most valuable estimate of the capabilities of men generally for particular walks, and avoid many practical errors of misplaced expectations. The statistics of colour-blindness, for example, has been a warning against employing persons indiscriminately as signal-men.

But to come at once to the point as regards the applicability of Mr. Galton's inquiries to Psychology. A psychological fact or law supposes a concurrence of *two* peculiarities; every law unites two factors. An observation of high or low visualising memory becomes psychology, the moment the property is connected with some second property, as cause, consequence, condition, concomitant, and not till then. The wider interest in determining the presence of some intellectual superiority, is the interest in knowing how to produce it, what things go along with it, and what things are excluded by it. The everlasting problem of education draws its solution from laws of concomitance and causation, not from a bare statement of the fact that a certain individual, A, has a large power of mental representation. Mr. Galton, in discussing the answers received to his questions, incidentally approaches this wider application, but generally he is content with classing and summing up the instances of high, middling, and low power of representation. Indeed, the questions put by him lead to no farther result; only, in some of the answers matter is introduced that can be turned to account in the way of illustrating laws of the mind.

For an investigation of this sort, whether for the narrower purpose of statistics, or for the wider purpose of discovering, correcting, or confirming psychological generalities, everything depends upon the precision of the returns, and that precision again depends in part upon the shaping of the questions. Mr. Galton first directs the subjects of his interrogatories to think of some definite object: "Suppose it is your breakfast table as you sat down to it this morning, and consider carefully the picture that rises before your mind's eye". Now I apprehend that this test is too narrow. In the first place, it is an exceedingly familiar object, and must be clearly and fully imaged by whoever can image anything at all. In the next place, there may be great differences in the degrees of attention given to the minutiæ of the table, according as the person is a mere recipient, or plays a chief part in providing and serving the viands. In the third place, it may be a very small, limited, and routine *menage*, or a large, elaborate, and various array. Fourth, we learn a familiar formula for including all the articles on the table, and can recover the details by the help of that formula, which may be a verbal string—cups, plates, knives, bread, &c. All these circumstances make great differences in the vividness and fulness of the mental representation. No doubt, it

is an advantage of obtaining returns from large numbers that individual peculiarities are eliminated, and prevailing distinctions made apparent. Still the result is purely statistical, and has little of the precision needed for psychology.

Instead of a single object I should be inclined to propose a variety of objects, chosen so as to test the power under different circumstances; and above all, to eliminate accidental influences. The point to be ascertained respecting each individual is the natural representative force of the mind for a given class of impressions, sight in this instance being taken. We wish to compare different minds upon this peculiarity, and under the same circumstances. This is the first and purest form of the inquiry, and supposes the circumstances nearly the same for all. It is a distinct inquiry, serving a different purpose, to ascertain the actually attained visual representative power, under the combined operation of natural power and favourable or unfavourable conditions. Now, while I would include such an object as the breakfast table, I would conjoin other objects that tested the power in different ways. I would ask for the impressions of some entirely new scenes, places, or groupings of objects, as in some recent visit to a place of interest. In this instance, there would be the peculiar advantage of recency; and, as a check, I would ask for the impressions of some place visited years before, in the same passing way. Such cases would be a severe test of the visual persistency as regards large and comprehensive pictures. For a test of detail, I would come home again to more familiar experiences, as the interior of known buildings, where there is a mixture of the fixed and the variable, for example, an assemblage at church, or the theatre, or a ball-room. This would be far more searching and more satisfactory than the breakfast table.

These four requirements would prove the representative power in very testing situations, but would not be exhaustive. The starry sky is an exceedingly good example. So is a large animal, as the elephant. Even the points of a horse would be testing, with individuals equally interested, or equally wanting in interest. The succession of shops in a street, not too familiar, and not too strange, is very testing to the visual memory. Indeed, it must be evident, as we reflect upon the problem in hand, that a promiscuous *viva voce* examination would be the really effectual proceeding. When we do proceed by written questions, the instances given should be varied and representative; while, at the same time, the answerers should be invited to exemplify their powers by self-chosen instances such as to bring out both their strength and their weakness.

I come now to the qualities of the image as set forth in Mr. Galton's queries. The first is *Illumination.* "Is the image dim or fairly clear? Is its lightness comparable to that of the actual scene?" The second is *Definition.* "Are all the objects pretty well defined at the same time, or is the place of sharpest definition at any one moment more contracted than it is in the real scene?" The third is *Colouring.* "Are the colours distinct and natural?"

It appears to me that the Illumination and the Colouring should be

taken together; both are included in the one circumstance of vividness or intensity. The same mental tenacity that sustains the brightness of the image ought, I think, to sustain the fulness and distinctness of the colouring; the only exception being in partial colour-blindness, a point that, in an investigation of this sort, should be brought out by a separate query. At all events, the two facts of brightness and colour should not be parted by the heterogeneous and distinct property of Definition.

As regards Definition, too little is asked; it is well to know whether the place of sharpest definition is in a contracted point, or whether the whole scene is well defined at the same moment; but this can hardly be deemed the main question. As, in regard to Illumination, a comparison is made with the actual scene, much more should such a comparison be made with Definition or detail. The extent and the truthfulness of the minute details make the real value of the image; and, unless I am greatly mistaken, carry the other properties along with them. The circumstances where the one class is high and the other low would be worthy of a special investigation. Besides, the comparison of the details of the image with the details of the original would not be so liable to illusion, uncertainty or mistake, as the comparison of the degrees of illumination.

Inasmuch as nothing is more certain in Intellectual Psychology than that the quality of an image is dependent on the quality of the original sensation, some preliminary questions on this last point should have been propounded. As the subject chosen is sight, the character of each individual's natural sensibility to colour and to form might have been ascertained, at least in an approximate way, from each one's own delineation. Only a testing cross-examination, with experimental trials, could give the matter with fulness and precision; but it would be of use to compare the language of each as to their sensations with the language used for the images. They could have been asked—Have you any special fondness for, or enjoyment of, colours; and if so, how does this manifest itself? Comparing yourself with others, are you above or below the generality in this particular? Then again—Have you a delicate discrimination of shades of colour, as compared with persons you know? To these questions could be appended a request to be assured of the presence or absence of any degree of colour-blindness or obtuseness, passing beyond mere inferiority in delicacy of discrimination.

Some one ought to devise an easily-worked apparatus for testing shades of colour discrimination. A spectrum very finely graded might serve the purpose; the test being the number of distinct shades that each person could count. Detached colour specimens could be taken as a check; the subject of the experiment being asked to sort and arrange them by agreements and differences. As a point of intellectual character this is fundamental. A similar test could be applied to the retinal sensibility for pure form: the two together make the sensory basis of visual imagery, to which basis the mental representations must inevitably conform. To determine by careful observations

the amount and conditions of such conformity, is one great psychological problem. There is even now a produceable body of evidence to prove that, as is the sense-discrimination, so is the goodness of the imagery, other things being the same. The concurrence of the musical memory with the musical ear is the best marked example. And although, as in the case of sight, we have not a sifted mass of observations, such as industrious inquirers like Mr. Galton may one day provide, there is also a most apparent concurrence in individuals between colour-discrimination and colour-memory, very notable in the two extremes. There is, moreover, to my mind a strong presumption from the physical side. Great minuteness of discrimination obviously require nervous elements in proportionate number, and this must also be a condition of the support of the mental image.

Notwithstanding the limited scope of the questions, the answers obtained by Mr. Galton are curious and suggestive, and might be followed up in certain cases with great profit. A few remarks occur to me in connexion with some of them.

In the instances where the visualising power is at its highest, there seems to be not the slightest hesitation in declaring the image to be equal to the original in brightness and in colouring, and, by implication although not often stated, in definition and detail. I cannot help regarding this as somewhat strong. The cases where any mental image, or any ideas of any of the senses, can be put on an equal footing with full reality, must surely be rare and exceptional. If I remember right, George Henry Lewes said of Dickens, speaking on Dickens's own authority, that his mental representation of a scene was perfectly equal to the actual impression. In his case, the allegation may perhaps be allowed; his powers of ideal delineation seemed to require extraordinary vividness and fulness of conception; yet less than the actuality might have sufficed. The abnormal conditions of dreaming, delirium, or other unnatural congestion of the nervous system, are able to give representations that attain to life-like vividness. Also, very strong emotion will contribute to bring a picture up to the reality; and in the high poetic examples, as in Dickens, an emotional tinge would always be present; we know that the delineations executed from such imagery are usually idealised. But it would take a good deal to convince me that five per cent of persons taken at random would be entitled to pronounce their ordinary mental representations of visible objects and scenes equal in all respects to the reality as seen by the eyes. The question put is a very trying one to answer, excepting only in the point of definition, which is not pressed home. To frame to one's self a scale of brightness and colouring, and to fix the place of one's own imagery in that scale is far from an easy task. The power of visible representation may deserve to be called remarkable, or even extraordinary, without being exalted to the pitch of full reality. The terms used in the answers to Mr. Galton's queries justify the distinctions that he draws between a very high, a middling, and a low degree of the visualising power;

and might even establish a greater number of well-marked gradations, perhaps five or six; but the phraseology used for the highest degrees must not be too literally insisted on. It would be interesting, nay indispensable, to have a full examination of some of those persons, to test them in every possible way; by which means, I have no doubt, their language would be rendered more exact, while the collaterals and consequences of such a power would be highly illustrative of the psychology of the conceptive faculty as well as of the constructive imagination.

Mr. Galton is naturally startled at finding eminent scientific men, by their own account, so very low in the visualising power. His explanation, I have no doubt, hits the mark; the deficiency is due to the natural antagonism of pictorial aptitude and abstract thought. There is a farther circumstance alluded to by Mr. Galton, in which I believe he is also correct, namely, the tendency to subordinate the visualising power to the special ends of the individual; to drop from the fulness of the imagery all unnecessary parts, and keep a hold of those that enter into our required trains. In order to use with effect the phrase "a free breakfast table," we do not need to conjure up a full and well-lighted picture of a breakfast table, in the way that Mr. Galton expected; the conception need not be pictorial at all, and it need not be exhaustive; only those articles have to be remembered that are for the time subject to fiscal imposts. Mr. Galton seems to think that in the scientific and practical employment of the imagery of the outer world, the concrete visual conception is exchanged for one connected with the motor sense; but here I think he misses the point. The picture is in every way reduced and shorn of its beams, but what remains is still held by our visible sensibility, in which the strongest holding ground is the retinal adhesion for form. The motor sensibility of the eyes assists, but is far inferior, alike in discrimination and in tenacity, to the retinal sensibility. Colour also aids; still, the visualising of colour is undoubtedly liable to be dropped except where it serves to make an essential distinction, or where it is naturally strong.

The case with scientific men, and with most kinds of professional workers, is plain enough. But what shall we say to Mr. Galton's including painters of the rank of Royal Academicians among those at the bottom of the scale in visualising power? This case wants much more probing. No man, I suspect, can be an artist without having the colour-sense good, from which goodness would flow the colour-memory and the colour-imagination. True, there are other merits in a painting besides colour, and a work of art may possess charms distinct from high execution in the colouring part. This is the point that should be pressed in a farther cross-examination of Mr. Galton's Academicians. Possibly, the principle of economising intellectual labour, under which the scientific man ceases to shape the imagery of the world in its concrete richness, may operate with the artist; but it would not in his case make the same havoc. What we should specially wish to ask these dim-visioned artists is, whether they are

aware of having ever possessed the easy visualising faculty, although they may have it no longer.

A confirmation of the fact that the faculty dwindles by disuse, and by limitation of interest, is given in Mr. Galton's comparison of his hundred adults with Charter-house boys. He finds among these last, and among young subjects generally, a greater vividness of colour-conception, than is maintained in advanced life. This is no contradiction to another fact, namely, that the power of the imagination is susceptible of indefinite increase. All that is implied is that the raw materials of conception—the crude pictures of actually occurring things, which are but partially available, whether for the man of science or the artist—are less vividly retained in later years. They are exchanged for an order of conceptions, which may also be highly concrete, but are wanting in matter-of-fact literality and the superfluous brilliancy of actual scenes. An eminent engineer, quoted by Mr. Galton, had highly developed power of recalling form, but described himself as deficient in the recall of colour. Being awakened to the point, he practised himself in visualising colours, and soon succeeded, thereby reclaiming a source of pleasure. Farther inquiry should be made in his case as to his early experience, before professional routine had blunted the edge of his conceiving faculty.

I had occasion to remark on the desirableness of more minute information respecting the individuals at the top of the scale of visualising power. Equally desirable would it be to push the investigations a little farther in regard to the instances at the bottom. At the lower end of the Charter-house gradation, the power of visualising is given as "nil". One can hardly be expected to rest content with an answer like this. The scene of a cricket match, or of a ball, ought to be recalled to the minds of those benighted boys, whose imagery is darkness visible, and the nature of their recollection of such scenes minutely probed. What ideas do they possess of anything? Do they find any available substitutes for the visualising power? How do they get through life at all? Are they able to enter into the same professions as those at the top or at the middle of the scale? For if they do, the mere pictorial power cannot be so very essential. At what points may it be supposed that the deficiency operates?

This is only putting in another form what has already been remarked as to the incompleteness of Mr. Galton's queries. It is very unsatisfactory to receive an answer on *one* faculty alone, especially if that is above or below average. Even for the sake of knowing all about a single power, we should know something of the other powers of the individual. The ear plays a part in our intellectual being second only to sight; the power of language is the rival power to visual conception, and, in the texture of the memory, may take its place. Something, therefore, should be known respecting the linguistic memory also, without which no statement of the intellectual peculiarity of the individual is complete.

One of Mr. Galton's inquiries related to the extent of mental view.

This is very various, as we may suppose, but I can hardly regard the difference as other than one of degree. It is part of the goodness of the conceiving power to realise at one instant a wide scene. Some of the answers to the main question as to vividness of imagery show a power of conceiving the portions of the scene specifically attended to, and no more. This I take to be simply an inferior degree of conceiving power. It is, to be sure, as good as the actual vision in this respect, that our actual perception of an object is distinct only at the point where the axis of vision falls; we collect the entire picture by shifting the glance over the parts successively. When we have impressed the whole on the memory in this way, our mental image is fuller and better than actual vision at any one moment; the picture is a compiled or aggregated picture, the result of many acts of sensible attention. The idea in this way far transcends the sensation; the mental glance at the starry vault might be equally full and distinct throughout; the actual glance is full at a central point, and is progressively vague away from that point.

It is, therefore, not a matter of surprise that some of Mr. Galton's witnesses should testify to the possession of a field of mental view larger than the reality. They can see all round a room, or take in at one glance the six faces of a die or the entire surface of a sphere. This is, in principle, nothing more than conceiving with equal distinctness all the parts of what the eye *learns* to compass at one glance. In both cases, there is an aggregation of successive acts of inspection; the picture is not a single glance possessing the vividness of the actual, it is a composition of many glances successively impressed. Hence we may find it just as easy to extend the sphere of mental view, as it is to fill it up with equal vividness.

Mr. Galton makes a separate point of the power of projecting an image. A blank piece of paper is placed in our hand, and we are asked to superimpose images upon our mental picture of the blank. I am disposed to believe that this power follows the visualising faculty in strict concomitance. It typifies the first stage of conception proper, the stage in advance of memory, and short of imagination. It is needed whenever we have to realise a description, and is anything but a strange or novel test of ability. Hobbes's mountain of gold is a degree beyond the placing of an object on a white paper. The best exercises for either testing or improving this higher stage of the conceiving power are still a matter for consideration.

In his comprehensive article in the *Fortnightly*, Mr. Galton suggests that the visualising faculty, as he depicts it, should be systematically educated. This, I think, is premature, even on his own showing. The fact that it is allowed to fall into disuse, proves that it is not needed for the ordinary purposes of life. Even at best, the literal imagery seems only to feed a more eclectic imagery suited to our real wants. A much deeper inquiry than has yet been made would be requisite in order to decide what additional special training should be imparted to the aptitude for retaining visual imagery in something of its realistic brightness and fulness. We ought never to think of

trying to picture objects indiscriminately; and the question would arise which objects and scenes should we select—a question inevitably modified by our future needs. There is a culture that is desirable in itself for people generally, namely, the power of conceiving with some degree of vivacity and completeness the descriptions given in geography, topography, travels, narratives, and picturesque poetry. Our unavoidable contact with the world, and the imagery incidentally acquired in the course of our education, enter into this equipment; and we may add, of ourselves, the express exercise of conceiving the scenes brought before us in verbal delineation. Such an exercise would properly belong to our voluntary or self-imposed education, and would be misplaced in any school curriculum.

A. Bain.

PERFECTION AS AN ETHICAL END.

Mr. Thornely's article (in Mind XIX.) on this subject is interesting alike from its novelty, and from the ability with which he pleads his case; but it appears to me that his theory is vitiated by a fundamental fallacy. Assuming the existence in human nature of "a moral impulse or desire of right" as the ultimate fact on which the science of Ethics depends, he remarks that, while its origin has been accounted for in a variety of ways, moralists of all schools unite in regarding this "moral motive or desire as a *means* only to something other than itself": . . "a motive . . which will have fulfilled its purpose and ceased to exist whenever a certain definite state of things shall have been reached, whether this state of things be taken to be universal happiness, or conformity to certain absolute rules, or the establishment of a certain inward balance of motives." Mr. Thornely thinks that this is reversing the right order of things, and that the truer view is "to take the desire of right or love of duty as the *end*, towards which all other motives, together with all acts bodily or mental, all institutions, and, finally, all life itself are to stand in the position of *means*. The desire of right he regards as "the only thing having absolute value in the universe". And his ideal of perfection is "a state of things where it shall have vanquished and destroyed every meaner impulse of man's nature, and constituted itself the sole impelling force to which he yields obedience".

Now, we must first note that the end is not to be perfection, but the *desire* of perfection; not right, but the *desire* of right; and the objection instantly occurs that if this be so, the moment a state of perfection is actually reached, we shall have attained the somewhat paradoxical position of an end beyond the ultimate end; an end beyond that end which Mr. Thornely has already declared to be "the only thing having absolute value in the universe". This difficulty is recognised by Mr. Thornely himself in the final paragraph of his article, where he says: "To what purpose our moral energies are destined to be put if they shall ever have completed their present

task and vanquished and subdued all inferior motives, we cannot even pretend to guess; but if we believe that there is a real positive purpose underlying the work of the Deity in the universe, . . . it is only natural to hope that when we have brought our powers into harmony with His will, we shall be allowed to employ them in furtherance of His work". This solution of the difficulty is somewhat vague, but, though I agree with Mr. Thornely that it is scarcely a subject for speculation, I venture to think that he hardly sees the full force of the difficulty itself.

In a state of perfection, Ethics or the study of moral principles must gradually become obsolete, or at least retain only an archæological interest, and I understand Mr. Thornely to agree that such will be the case. But if the desire of right is to die also, I confess I do not see how the practice of morality or rather of right is to survive either. To make this clearer, let us examine the functions and meaning of morality a little more closely. Morality of course can only find place in an environment of more or less imperfection, for it implies the possible alternative of immorality. It postulates a recognition of the distinction between right and wrong, but it also involves the possibility of a preference for one or the other. Virtue consists in eschewing evil and pursuing good; but where there is no evil to eschew, there can be no virtue or virtuous action. It is meaningless, for instance, to speak of God as being virtuous. The distinction of right and wrong may well exist in the minds of men, unaffected by the degree of perfection to which they have attained; for even in a state of perfection it would be possible to conceive a state of things diametrically opposite; and this latter would be called evil or wrong, in contradistinction to the existing state of perfection which would be regarded as good or right. But in this state of perfection—I mean of course, as I presume Mr. Thornely does also, a perfection relative to our physical environment—there can be no morality, for there can be no desire to do wrong.

And this brings me to what I conceive is the confusion that has misled Mr. Thornely. It will be observed that he uses "desire of right" and "love of duty" as synonymous terms. Now it appears to me that they are by no means synonymous.

The desire of right is not incompatible with a state of perfection; the love of duty, as I understand duty, is incompatible with such a state, because in it the conception of duty as such must disappear. If mankind had never had any desire save for that which was right, the conception of duty could never have arisen; for an essential prerequisite of this conception is a conflict of desires. It is the desire of right which causes us to love duty, that is to say, to love that course of action which fulfils our desire of right in spite of conflicting desires. But when all conflicting desires have been destroyed, the love of duty —Mr. Thornely's *end*—will perish from inanition. The desire of right will survive, and will survive with the enhanced vigour derived from the other impulses of man's nature which it has, not destroyed, but rather absorbed, as Mr. Thornely brilliantly and suggestively puts

it, by a process "answering to what is known in the physical world as the transmutation or conversion of energy".

And here I am at one with him; but it seems to me that this view of perfection differs verbally only from that which holds that, "Perfection will be reached when the appetites, affections, and desires shall have been brought to a certain desired degree of strength"; or as Tennyson has it, when

> "the full grown will
> Circled through all experiences, pure law,
> Commeasure perfect freedom".

To return for a moment to a criticism that I have already suggested. Surely it is only in a strained and unnatural sense that we can speak of the desire of a thing as an end ulterior to the thing desired. The thing we desire must be something which is at any rate regarded as more valuable than the desire itself. Were this not so, it is not easy to see why we should ever put an end to our desire by gratifying it. Apply this to Ethics, and we obtain as the result an ethical system whose end is not *πρακτικόν τι*—an active virtuous state—but an empty desire for such.

Briefly to recapitulate. In seems to me that the end must be right, not the desire of right. That even in a state of perfection the desire of right, of the *καλὸν κἀγαθόν*, will survive as a *βουλευτικὴ ὄρεξις*, and will be perpetually fulfilled by a life of absolute rectitude. The love of duty will disappear, because all distinctive conception of duty as such must disappear also, by an absorption, so to speak, into that supreme desire of rectitude which will be at once our only wish and our only welfare.

NORMAN PEARSON.

BRUTE REASON (II.).[1]

Perhaps the shortest as well as the completest refutation of the "inductive" argument for brute reason would be found in the simple statement of the postulate upon which it proceeds, and apart from which it is wholly without meaning, namely, that *the exhibition of discrimination, design, and adaptation in actions indicates reason in the agents*—an assumption never expressed, yet always, and necessarily implied; but which not only begs the whole question at issue, but goes far beyond it, involving the rationality even of plants and inanimate matter, as well as of animals in respect of actions generally admitted to be "purely instinctive".

It may be well, too, to observe here, that, viewed thus in its completeness, this argument, though commonly called inductive, is really the enthymematical form of the deductive process, of which this postulate is here the suppressed major premiss, the "facts before us" serving as so many minor premisses, which, with the conclusion, form as many separate deductions.

[1] Concluded from MIND XIX., p. 409.

We now resume the examination of this subject where we left off in a former paper. We have seen that reason and instinct cannot co-exist in the same individual; that rationality in an animal would involve the destruction of those very powers which commonly distinguish animals from men. A bee either knows or it does not know the geometric value and significance of hexagons and rhomboids. It cannot both know and be ignorant of them at the same time. Neither can it be supposed to "know and intend" in unusual circumstances an alteration, upon mathematical principles, of a work the very existence of which it was ignorant of till a moment before, when originally constructing it, upon the same principles, in "ordinary and natural circumstances". We have, therefore, arrived at this position, namely, that *animals are either instinctive or rational; they cannot be both.* Hence it finally remains to be considered which of these two alternatives is the more probable.

This, however, may seem a superfluous task to all but those upon whose minds the notion of brute reason has taken so fast a hold as to assume the appearance of an "evident" truth; or in whose philosophical systems its assumption constitutes an essential factor. Once admit the incompatibility of reason with instinct in the same individual, and the consequences scarcely allow of discussion. If it be true that animals are *either* instinctive *or* rational, the testimony of the "facts before us" is no longer equivocal. Then, indeed, the inductive method may be effectively applied; but whether inductive or deductive, the argument is equally brief and decisive. To those, therefore, in whose judgment the conduct of animals still carries with it its own evidence of rationality the following considerations are commended.

1. It is in the nature of things impossible logically and philosophically to show that animals do reason. This will scarcely be disputed if the two following facts are recognised.

(*a.*) That, language apart, neither the operations of animals, however skilful, nor even the handiworks of men, however artistic, afford of themselves any evidence of the rationality of the workers. If a being, say, from another planet, could visit our world, with no previous knowledge of men or of animals, their works or their habits, and with no capacity for acquiring human language, yet possessed of intelligence and faculties adapted for closely and accurately observing the works and conduct both of men and of animals, and marking from a rational point of view the sagacity and skill observable in their purposes and relations, their adaptations and achievements, it can hardly be doubted that such being would, on reflection, ascribe a large proportion of the "purely instinctive" conduct of animals with some of the highest of human achievements to mental powers similarly constituted operating under the same laws, notwithstanding the strange diversity of physical conditions under which the workers exist. The structure and furnishing of a beehive, of various ant hills and nests, of a palace or mansion, and of an ordinary street or town, together with the daily activities of their inhabitants, would present to him the same general features of discrimination, design, and adap-

tation, differing, if at all, in scarcely appreciable degrees, as between the man and the animal. Of two specimens of paper placed before him, the one from the hand of man, the other from the mandibles of the wasp, it would be impossible for him to say which was the product of reason and which of instinct. So of the conduct of the solitary wasp in providing for the sustentation of its posthumous young, and the measures adopted amongst men for the support and wellbeing of a coming generation. Clearly, then, mere works, even though works of art, or schemes of forethought and providence, of themselves afford no evidence of reasoning in the workers.

(*b.*) That the only reliable test of rationality objectively available to us is *discourse*. While of our own rationality we have the conclusive evidence of consciousness, our intercourse with our fellowmen furnishes us with the only, though scarcely less conclusive, evidence of their rationality. We can lead them simultaneously into a course of ratiocination and the exhibition of the details of that course by dint of language oral or written. But by no such tests can we place ourselves in a position to affirm that brutes reason. We can hold no rational intercourse with them, since they neither have nor can be taught any language as a common medium of intercourse between them and ourselves. The deaf and blind and dumb of the human race can be taught a language, and the extent of their reasoning power is then mainly a question of culture and endurance.[1] But animals which are neither blind, nor deaf, nor *dumb*, but which can be made to utter words in any language with considerable distinctness and accuracy, and even to articulate appropriately whole sentences in response to given words or signs, cannot be taught to utilise their powers of speech for any even of the simplest or most serious purposes of life, though reared and kept in families many years where one language, and but one, is constantly spoken. Teach an animal to speak as you may, you cannot throughout its whole life of, say, twenty to fifty years, effect in it that rational development, as evinced in the practical utilising of the power of speech, which a child untaught exhibits in three or four years. Test the supposed reasoning powers of a dog by the simplest and most effective means. Hold a bone before him, and tell him in language he is daily accustomed to hear that it is poisoned and will kill him if he take it; promise him some better and wholesome food instead; and what is the result? Your

[1] Laura Bridgman, totally blind and deaf and dumb from early infancy, and with scarcely any sense of taste or smell, writes, in her twentieth year, to her brother, in the course of a long letter—"I study Algebra, Geometry, Physiology, N. Philosophy, History. Last month I implored Wight to please to teach me Algebra and Geometry. She said that it was very difficult for me to study them. G. seems very difficult for me to comprehend it perfectly. . . . When I first studied G., Wight was very kind and patient to explain to me the meaning of all those things so repeatedly for a week. I thought it was impossible to understand G., but I rejoice very much to be able to puzzle [it] out at last."—*Life and Education of Laura D. Bridgman*, by Mary Swift Lamson.

words have not the least attention; the bone absorbs it all, and if you let him he will take it notwithstanding your warning. Teach a parrot to utter a number of words, explain them each to it, and then arrange them into a plain and simple sentence to the effect that you will kill it unless it perform some special course of action to which it is unaccustomed, though easily capable of performing it; throw into your manner the utmost apparent seriousness; still your threat will occasion not the least perturbation, and if it answer you at all it will do so in one or more of its stock phrases, however ludicrously irrelevant. Yet here you have, in language with which they have ever been daily and hourly familiar, threatened their lives, which animals are ever prompt to defend with the utmost energy in circumstances of danger.

Moreover, it is highly significant in its bearing upon this question, that while it seems to be an inherent property of the human mind to seek the best available means of receiving and communicating its ideas, animals which can speak practically as well as man never use their powers of speech for the purposes of *mutual* intercourse. Still more significant is this in view of the further fact that language, though absolutely essential to the development and practical utility of the rational powers, is in every case artificial—the creature of that reason to the development of which it is so essential. And here we seem to have a complete answer to any argument for brute reason founded on the supposed possession of "natural language" by certain animals, as the ant and the bee. Whatever be their means of inciting each other to co-operate to a common end, it is clear that it differs essentially from human language. They neither construct it nor acquire it as man does his language, but possess it at their birth. They receive it as they receive their senses; and for aught we can perceive it operates much as the appetites and passions operate both amongst animals and mankind. Its possession, therefore, no more implies rationality than the possession of sight, hearing, feeling, or the sexual and social affinities.

Now the human mind cannot remain content to express itself in mere ambiguous gesticulation while a better medium is open to it. It requires definite and intelligible signs; and of these it employs the most expressive within its command. No human being, for example, normally possessed of the gift of speech would prefer to use manual signs. But those signs, whatever they be, can only become available through express mutual agreement between the communicating parties both as to the signs themselves and their significations and powers. Thus a child learns to converse with its parents, and succeeds only as it comprehends and adopts their symbols, with their separate and combined significations. Those symbols are words uttered by the mouth, the most convenient and perfect mode of intelligent communication. And this the child learns of itself. It does not need to be taught. Its language, though wholly artificial, grows with the growth of its intelligence—*language*, not mere words, disconnected, incongruous, meaningless; but arranged in increasingly multifarious disposi-

tions and applications, the various significations and powers of each separate word, with their indefinite number of modifications in the increasingly numerous and varied combinations of those words, as required to express the ever-growing number, variety, and complexity of the child's ideas. And this is true of all children reared where any language is spoken, unless afflicted with deafness, or with malformation, or disease of the brain, or of the vocal organs; but it is not true of any animal, even of those which have the gift of speech and can utter and connect words the pronunciation of which by a human being involves very complex action of the vocal organs. Language, then, being the sole medium of intelligent intercourse amongst mankind, it is manifest that the want of it amongst animals must form an insuperable bar to any positive evidence of reasoning power in them, while their incapacity for constructing or acquiring any language, even though possessing the gift of speech, affords very strong presumptive evidence against their having such reasoning power.

2. If animals do reason they must have reasoning faculties or powers *which either are similar in their nature and operations to those of men or they are not.* If they *are*, they must, like his, be capable of indefinite culture and development. Not only are animals then rational in the strictest sense of the term, but they are co-equal with man in their moral and intellectual nature and capabilities, and have an ultimate destiny scarcely, if at all, inferior to his; and this altogether apart from any question or fact as to the evolution of man from the lower animals. If their reasoning powers be essentially different from man's, in what does the difference consist? Man observes, searches after, or assumes facts, and deduces consequences therefrom, which, in turn, become the facts or premisses from which he deduces further consequences, and so on *ad infinitum.* Every conclusion thus drawn furnishes an addition to his previous stock of knowledge, the intrinsic truth or falsity of which he further tests by comparing them with other related truths which are either self-evident or have been already established beyond question. If such conclusions, following logically from the premisses, accord with those truths, they are accepted as true; if not, both they and their premisses are rejected as false, the knowledge which they seem to furnish being deemed to be error instead of truth. This is man's mode of reasoning; it embraces both the inductive and the deductive methods, and is his only means of acquiring objective knowledge not derivable directly through the senses. Nor is any other conceivable. If, then, the process of brute reasoning be different from ours, the difference should be in the limitations merely, and not in the nature of the process. And this is, indeed, the only distinction commonly held to subsist between the reasoning power of animals and that of man. Animals, we are often told, reason from fewer ideas than men. Yet ideas compared necessarily suggest new ideas; these compared suggest others, and so on. This *is* the reasoning process; and the possible extent of its range is obviously a mere question of actual culture.

But the same faculties or powers are required for the few ideas as for the many so far as regards any logical use of them. If, then, those powers in animals be the same as in man in their nature and *modus operandi*, they must also be capable generally of the same culture and development; in which case, not only is the actual intellectual and moral equality of animals with man a mere question of time, but their progress in that direction should have presented unmistakable indications during the past history of the species.

Yet no truth stands out more prominently in natural history, than that of the stationary character of the operations of every species of animal. The bee builds the same cell, the wasp manufactures the same paper, the spider weaves the same web, as in the earliest periods of their recorded history. There is neither advance nor retrogression in their works, as in the works of man, to show either increase or decrease of intellectual power. True, certain modifications of the habits and works of individual animals occur, as those animals' circumstances and conditions of life are varied; but these, with the same species are ever the same in like circumstances, and can only be classed with the conduct of Huber's bees in turning the comb to avoid the glass. Restore the animals to their former condition, and they revert to their former habits, and resume their former works, as if they had never been interrupted.

3. Lastly, there is the important fact that, in many instances in the conduct of animals in which, to mere observation, appearances seem most to favour the reason-hypothesis, *it is in the nature of things impossible that such conduct should result from reasoning on the part of the animals.* This fact alone should go far to close the entire controversy; since, if we are forbidden by the nature of things to attribute to reason actions exhibiting in the highest degrees the semblance of astute sagacity of discrimination, design, and adaptation, with the employment of highly complex, yet most effective, means to ends, surely it were a poor philosophy indeed that should seek by the aid of the reason-hypothesis to account for actions exhibiting those self-same qualities in lower degrees, merely because the same intrinsic objections to that hypothesis were in their case superficially less manifest. If the higher classes of actions be, from the very fact of their lofty elaborate, discriminating, far-seeing, far-reaching character, inexplicable upon the reason-hypothesis, and inconsistent with it, upon what principle either of philosophy or of common sense can we attribute the lower classes to reason? Now, it is very significant that of all the innumerable stories which believers in brute reason are never tired of citing as instances of brute reasoning, those to which they attach the most importance are invariably those which on the reason-hypothesis leave the most to be explained. They are such as in the nature of things could not have been performed rationally, notwithstanding the motives, aims, and reasons so freely attributed by the narrators to the animals in question. Take the two following instances of home-finding. Dr. Hancock tells of a dog which, having been taken from London to Scotland by sea, found its way home

again by land;[1] Mr. Spence, of an ass which, shipped on board a British frigate at Gibraltar for Malta, was thrown overboard in a storm off Point de Gat, swam safe to shore, and made its way back to Gibraltar, "a distance of more than 200 miles, through a mountainous and intricate country intersected by streams, which he had never traversed before, and in so short a period that he could not have made one false turn".[2] Now, both these animals, being domestic and not migratory, were here placed in circumstances in which—according to the current theory of instinct, *i.e.*, the theory which by the limitations it attaches to the scope of instinctive operation makes reason its essential complement—instinct should have proved to be entirely at fault, leaving the animals wholly dependent for direction upon such resources as their reason might be able to furnish. Yet by no possibility could these animals in such circumstances have reasoned their way home. The circumstances were neither "ordinary" nor "natural" to the animals, yet they made their way homeward with undeviating accuracy "without instruction or experience". A man in such a case, if sufficiently educated, might possibly have guided himself—though not with the precision of the ass—by observing the positions of the heavenly bodies, if these were visible, or the indications of finger-posts, if there were any; or, at the worst, he could have inquired his way. But the use of any of these means would have necessitated a very careful, constant, and judicious exercise of the reasoning faculties. These animals had no such resources. They knew nothing of the roads, nothing of stars or of finger-posts, and they had no power of speech. They were destitute, not only of the knowledge necessary for rational guidance, but of all means of acquiring it. The essential conditions and appliances for reasoning were absolutely wanting.

And so, if we carefully apply the like simple tests to any of the marvellous stories told about brute reasoning, the results will unquestionably prove the same in each case. The material and appliances for reasoning at the animal's command will be found wholly inadequate to the achievements performed. This, however, is what believers in brute reason invariably fail to perceive. They beguile themselves by viewing the conduct of the animals in the light of their foregone conclusions, and from a human and even a cultured standpoint. They forget how much they themselves owe to education, not merely that of their childhood and schooldays, though that were incalculable, but incomparably more to that arising from their constant intercourse with rational and even cultured fellow-beings—an education incessantly, though imperceptibly enlarged and varied and developed by the ever changing minutiæ of life's experience, familiarising them with innumerable facts and truths and principles to which even the most favoured of animals must, from the narrowness and fixedness of the routine of their daily existence, necessarily remain wholly unacces-

[1] *Instinct and its Moral and Physical Relations*, by Thomas Hancock, M.D., p. 72.

[2] Note to "Instincts of Insects" in *Entomology*, by Kirby and Spence.

sible, but without the knowledge of which facts and truths and principles reasoning such as they are credited with is absolutely impossible.

JOHN LE MARCHANT BISHOP.

THE FEELING OF EFFORT.

Dr. William James, Assistant Professor of Physiology in Harvard University, has recently contributed to the Anniversary Memoirs of the Boston Society of Natural History, 1880, a dissertation, bearing the above title, from which we extract in the meantime the following summary of "Conclusions":—

"(1). Muscular effort, properly so called, and mental effort, properly so called, must be distinguished. What is commonly known as 'muscular exertion,' is a compound of the two.

(2). The only feelings and ideas connected with muscular motion are feelings and ideas of it *as effected*. Muscular effort proper is a sum of feelings in afferent nerve tracts, resulting from motion being *effected*.

(3). The pretended feeling of efferent innervation does not exist—the evidence for it drawn from paralysis of single eye muscles vanishing when we take the position of the sound eye into account.

(4). The philosophers who have located the human sense of force and spontaneity in the *nexus* between the volition and the muscular contraction, making it thus join the inner and the outer worlds, have gone astray.

(5). The point of application of the volitional effort always lies within the inner world, being an idea or representation of afferent sensations of some sort. From its intrinsic nature or from the presence of other ideas, this representation may spontaneously tend to lapse from vivid and stable consciousness. Mental effort may then accompany its maintenance. That (being once maintained) it should, by the connexion between its cerebral seat and other bodily parts, give rise to movements in the so-called voluntary muscles, or in glands, vessels, and viscera, is a subsidiary and secondary matter, with which the psychic effort has nothing immediately to do.

(6). Attention, belief, affirmation, and motor volition, are thus four names for an identical process, incidental to the conflict of ideas alone, the survival of one in spite of the opposition of others.

(7). The surviving idea is invested with a sense of reality which cannot at present be further analysed.

(8). The question whether, when its survival involves the feeling of effort, this feeling is determined in advance or absolutely ambiguous and matter of chance as far as all the other data are concerned, is the real question of the freedom of the will, and explains the strange intimateness of the feeling of effort to our personality.

(9). To single out the sense of muscular resistance as the 'force sense,' which alone can make us acquainted with the reality of an outward world, is an error. We cognise outer reality by every sense. The muscular makes us aware of its hardness and pressure, just as other afferent senses make us aware of its other qualities. If they are too anthropomorphic to be true, so is it also.

(10). The ideational nerve tracts alone are the seat of the feeling of mental effort. It involves no discharge downward into tracts connecting them with lower executive centres; though such discharge may follow upon the completion of the nerve processes to which the effort corresponds."

VIII.—NEW BOOKS.

[*These Notes are not meant to exclude, and sometimes are intentionally preliminary to, Critical Notices of the more important works later on.*]

Lectures on the Science and Art of Education, with other Lectures and Essays. By the late JOSEPH PAYNE, the first Professor of the Science and Art of Education in the College of Preceptors, London. Edited by his Son, Joseph Frank Payne, M.D., Fellow of Magdalen College, Oxford. London: Longmans, 1880. Pp. 386.

Dr. J. F. Payne, in collecting these Lectures and Essays, has not only discharged a pious duty to the memory of his honoured father, but done a great service to all who are concerned in the reform of Education. From the year 1830, when at the age of 23 he published the "Compendious Exposition of Jacotot's System of Education" reproduced in the present volume (pp. 335-86), Joseph Payne, by quiet unremitting labour, did as much as any other man in this country to bring on the present educational awakening. For a long time, after the publication of his first Essay, his influence was mainly that of a practical teacher, but, as soon as he was set free from the cares of his profession in the year 1863, he resumed his pen and began a new career of activity, chiefly as a lecturer to the College of Preceptors of which he had been one of the first founders, in 1846. The present volume contains most of the occasional lectures he delivered there or elsewhere up to the time of his death in 1876. It includes also the carefully composed and condensed statement of his fundamental notions, "Principles of the Science of Education" (pp. 97-100), put into the hands of his students at the College of Preceptors, where, in the year 1872, he was appointed the first English Professor of the Science and Art of Education. Three of his previously published lectures—on Fröbel, Jacotot, and Pestalozzi—are held over from the present collection to "form, with some unpublished lectures, a volume on the History of Education, which may, it is hoped, if sufficient encouragement is met with, follow this". In the pieces here collected, the author's great plea, that the educator ought to be guided by a conscious reference to underlying principles of physiology, psychology and ethics, is never argued without admirable balance of judgment. The good sense that always goes with his enthusiasm is particularly manifest in the paper entitled "The Curriculum of Modern Education". His fundamental psychological principle, borrowed from Jacotot, that the child is educated strictly and only by what he is led to do for himself, receives everywhere the most effective handling.

Animal Magnetism. Physiological Observations by RUDOLF HEIDENHAIN, M.D., Professor of Physiology in the University of Breslau. Translated from the Fourth German Edition by L. C. Wooldridge, B.Sc., London, with a Preface by G. J. Romanes, F.R.S. London: Kegan Paul, 1880. Pp. xiv. 108.

This is a translation of a lecture delivered in January by Prof. Heidenhain of Breslau on the subject of mesmeric trance, *apropos* of some public demonstrations then being made in that part of Germany by a clever Danish mesmerist named Hansen. The eminent physiologist was moved by the popular excitement over the phenomena to subject them to a strict investigation, and the lecture contains both a record of carefully made experiments (chiefly by Heidenhain himself, upon thoroughly trustworthy subjects) and a physiological interpretation of them. Added to the lecture is an account, filling half the little volume, of further results obtained with the help of Dr. Grützner. The results, for the most part, do not go beyond those obtained long ago by Braid: the interest of the present inquiry lies in its being made by a trained physiologist in the light of the latest knowledge of the nervous system. Heidenhain's interpretation is shortly given in the following extract:—

"In the face of all these facts, it appears to me that the hypothesis *that the cause of the phenomena of hypnotism lies in the inhibition of the activity of the ganglion-cells of the cerebral cortex* is not a too adventurous one; the inhibition being brought about by gentle prolonged stimulation of the sensory nerves of the face, or of the auditory or optic nerve."

Mr. Romanes, in his short Introduction to the translation, gives in his adhesion to the view that the physiological fact of Inhibition supplies the true ground of explanation, but he is less satisfied than Heidenhain that we can yet speak of the phenomena as being adequately explained. The translation is well and carefully made, but, in the title, omits the rather important qualification "so called" prefixed in the original to the words "Animal Magnetism".

Mr. G. Stanley Hall, who has taken part in Heidenhain's experiments, will deal with the whole subject in the next number of MIND.

Lectures on the Origin and Growth of Religion as illustrated by the Religion of Ancient Egypt. Delivered in May and June, 1879. By P. LE PAGE RENOUF. The Hibbert Lectures, 1879. London: Williams & Norgate, 1880. Pp. 259.

The author develops his subject under the following heads, giving one lecture to each: (1) The Sources of Information respecting the ancient Egyptian Religion; (2) Antiquity and Characteristics of Egyptian Civilisation; (3) The Gods of Egypt; (4) Communion with the Unseen World; (5) The Religious Books of Egypt; (6) Religious Books and Hymns: Henotheism, Pantheism, and Materialism. The following sentences from his 'Conclusion' give the author's main results:—

"The interest which the history of Egyptian religion inspires must be derived solely from itself, not from any hypothetical connexion with other systems. . . . . This religion was not from the first that mere worship of brutes which strangers imagined it in the days of its decline. The worship of the sacred animals was not a principle but a consequence; it presupposes the rest of the religion as its foundation, and it acquired its full development only in the declining periods of the Egyptian history. It is based

upon symbols derived from the mythology. The mythology has exactly the same origin as the mythology of our own Aryan ancestors. The early language had no words to express abstract conceptions, and the operations of nature were spoken of in terms which would now be thought poetical or at least metaphorical, but were then the simplest expressions of popular intuition. The *nomina* became *numina*. The Egyptian mythology, so far as I can see, dealt only with those phenomena of nature which are conspicuously the result of fixed law, such as the rising and setting of the sun, moon and stars. . . . . Besides the powers recognised by the mythology, the Egyptians from the very first spoke of the Power by whom the whole physical and moral government of the universe is directed, upon whom each individual depends, and to whom he is responsible. The moral code which they identified with the law governing the universe was a pure and noble one. . . . . The rites are paid to the departed because death is but the beginning of a new life, and that life will never end."

M. Tullii Ciceronis De Natura Deorum Libri Tres. With Introduction and Commentary by Joseph B. Mayor, M.A., Professor of Moral Philosophy at King's College, London, &c. Together with a New Collation of several of the English MSS. by J. H. Swainson, M.A. Vol. I. Cambridge: University Press, 1880. Pp. lxxi, 228.

Prof. Mayor's Introduction to this most carefully wrought edition of the *De Natura Deorum* includes, besides an Analysis and elaborate discussion of the Sources of Book I., an Historical Sketch of Greek Philosophy from Thales to Cicero (pp. ix.-xxxvii.). The design is to exhibit the general relation of the views of earlier philosophers, to which Cicero is continually referring; leaving points of detail to be discussed in the notes on each particular passage. The sketch ends with a more particular statement of Cicero's own relations to the four great Greek schools. Prof. Mayor finds the indecision of Cicero's political views reflected in his philosophy.

"Epicureanism indeed he condemns . . . its want of idealism, its prosaic regard for matter of fact, or rather its exclusive regard for the lower fact to the neglect of the higher, its aversion to public life, above all perhaps its contempt for literature as such, were odious in his eyes. But neither is its rival quite to his taste. While attracted by the lofty tone of its moral and religious teaching, he is repelled by its dogmatism, its extravagance and its technicalities. Of the two remaining schools, the Peripatetic had forgotten the more distinctive portion of the teaching of its founder . . . and it had dwindled accordingly into a colourless doctrine of common sense, of which Cicero speaks with respect indeed, but without enthusiasm. The Academy on the other hand was endeared to him as being lineally descended from Plato, for whose sublime idealism and consummate beauty of style he cherished an admiration little short of idolatry, and also as being the least dogmatic of systems and the most helpful to the orator from the importance it attached to the use of negative dialectics. . . . The conclusion of his argument on the nature of the Gods may be considered to point the way, vaguely indeed and hesitatingly, to the mysticism of later times, when the human mind, wearied out with its fruitless search after truth, abjured reason for faith and surrendered itself blindly either to the traditions of priests or to the inward vision of the Neo-Platonists."

La Science Sociale contemporaine. Par Alfred Fouillée. Paris: Hachette, 1880. Pp. xiii, 424.

M. Fouillée here continues the application of his philosophical method of "reconciliation," taking for his subject that social science which is the chief problem of the present time and which is more and more seen to involve the solution of all other questions relating to man,—moral, psychological and even biological. The two ideas which he finds here in conflict are those of Social Contract and Social Organism, the former as upheld by the school of Rousseau (mainly French), the latter by the historical and the naturalist schools of this century. It is but another case of the great antithesis of Will and Determinism which M. Fouillée has previously discussed in different aspects, in his *Liberté* and *Idée moderne du Droit.*

"Here again it does not seem to us impossible to bring together the opposed doctrines of idealism and naturalism, and even to reconcile them entirely in the domain of practice, by showing through what force the *ideal*, present to our thought, may be realised in *nature* itself. Far from seeming to us opposed, the theories of voluntary contract and organic evolution appear to us inseparable: the true human society ought to show them in unity. We shall therefore place ourselves by turns, in this book, at the different points of view of the opposed schools, so as to discover their relative truth and final harmony. We hope thus to obtain, at the end, as a practical result, a more comprehensive notion of social justice and social fraternity."

Histoire de la Philosophie Scolastique. Par B. Hauréau. Seconde Partie, Tome Premier. Paris: Pedone-Lauriel, 1880. Pp. 462.

In its new form M. Hauréau's work takes undoubtedly the first place as an accurate and comprehensive history of Scholasticism. The position of the author has afforded him unusual facilities for adding to and improving the brilliant sketch of Scholastic Philosophy which appeared in 1850 (*De la Philosophie Scolastique*, 2 vols.), and his special researches, some of which have already been published in the interesting volume *Singularités Historiques et Littéraires*, 1861, have enabled him to cast fresh light on many obscure epochs of mediæval thought. The present volume, taking up the history from the revival of literary and scientific studies in the 12th century, passes in review the main features of the intellectual life of Europe in the 13th and 14th centuries, gives new and valuable information as to the studies at the University of Paris during that period and as to the eminent but little known writers who prepared the way for the great development of Scholastic Philosophy, and concludes with an elaborate treatment of Albertus Magnus and Thomas Aquinas. Of the new matter contained in the volume perhaps the most interesting portions are those bearing on the history of the study of Aristotle at the Paris University, with respect to which Hauréau's researches have enabled him to clear up a hitherto unexplained fact; on the sources of the numerous heresies of the 13th century; and on the eminent but well-

nigh forgotten Paris doctor, John of Rochelle, of whose psychology a copious and valuable analysis is given. We shall wait with much interest for the appearance of the concluding volume of M. Hauréau's work, which will deal with the perplexed history of the dissolution of scholasticism. [R. A.]

Handbuch der Physiologie. Herausgegeben von Dr. L. Hermann, Professor der Physiologie an der Universität Zürich. Dritter Band. 'Physiologie der Sinnesorgane.' Theile I., II. Leipzig: Vogel, 1879-80. Pp. 602, 461.

The two parts of this third volume of the comprehensive treatise on Physiology (in six volumes) edited by Prof. Hermann and written with the co-operation of no less than twenty-two other German physiologists of distinguished academic standing, contain the most elaborate account of the Human Senses, taken together, that has yet appeared. Part I. is wholly devoted to Sight. It consists of four sections: the first two, on Dioptrics and Sensation of Light, by Prof. A. Fick (pp. 3-138, 139-234); the third, on the Chemistry of the Retina, by Prof. W. Kühne (pp. 235-342); the last, on the Space-sense and Movements of the Eye, by Prof. E. Hering (pp. 343-601). Part II. begins with Hearing by Prof. V. Hensen (pp. 3-142); then follow, in succession, Taste and Smell by Prof. M. v. Vintschgau (pp. 145-286), Touch and Common Sensation by Prof. O. Funke (pp. 289-414, the last two or three pages compiled from Funke's notes, on his death last year, by Prof. J. Latschenberger), Sense of Temperature by E. Hering (pp. 415 39), with a short Appendix on Irradiation to Hering's other article (pp. 440-8), and a General Index. It will be impossible, at any time, to criticise so many articles, or rather treatises, in detail, but references to them will henceforth always be necessary when the subjects come up for treatment in this journal. In the way of general remark, it may be said that there is a want of proportion among the constituent elements of the account of Sight, especially in Kühne's overgrown article; while Hering, in dealing with his part of the subject, has far too much, for a work of this kind, indulged in the expression of personal views. Funke's article on Touch &c. is a very careful and honest piece of work. Before long there may be an opportunity, in these pages, of dealing more particularly with some of his positions.

Geschichte der neuern Philosophie. Von Kuno Fischer. Erster Band. Zweiter Theil: 'Fortbildung der Lehre Descartes; Spinoza'. Dritte neu bearbeitete Auflage. München: Bassermann, 1880. Pp. 556.

In this second part of his first volume, Prof. Kuno Fischer follows out the same plan of thorough revision which he set himself in issuing the new edition of his first part, dealing with Descartes and earlier philosophy (Mind XIV., p. 292). There was still more to be done in bringing the account of Spinoza up to date than was necessary in the case of Descartes; so much inquiry having been spent upon

the Jewish thinker since 1862, when the author's second edition appeared. Amongst the additions is chiefly to be noted the exposition (pp. 204-42), made in the author's usual felicitous manner, of the *Tractatus brevis*, not published in full till the year 1862. The author also enters at length into the whole question of the relation of Spinoza to his predecessors, which has been so warmly and variously debated since the publication of the *Tractatus*. Without going as particularly into Joël's evidence as did Mr. Sorley in the last number of MIND, Prof. Kuno Fischer as distinctly rejects the notion of a special influence from the mediæval Jewish thinkers, and he rejects also in turn the different theories of Spinoza's development advanced by Sigwart, Avenarius and others. Against all the later theories alike he maintains his own earlier view that as far as Spinoza was moved to thought by an external impulse, this came from none but Descartes. He now puts the case thus:—

"My notion of the development of Spinoza is that his fundamental views never change but are in the main fixed already in the *Tractatus brevis* (including the *Dialogues)*, and that the great difficulties which made his progress slow lay in the elaboration of the geometrical *technique* of his system. In that methodic working out of his doctrine Descartes, if not his model, was yet his guide, and Descartes alone. In his pantheistic principles Spinoza appears as the opponent of Descartes," but as one who was driven to take up the antagonistic position by the very contradictions inherent in the fundamental Cartesian doctrine of substance.

Abriss der philosophischen Grund-Wissenschaften. Von Dr. GUSTAV GLOGAU, Privat-Docent der Philosophie a.d. Universität Zürich. Erster Theil: "Die Form und die Bewegungsgesetze des Geistes". Breslau: Koebner, 1880. Pp. xxii, 397.

This is the first part of a comprehensive philosophical work, dedicated to Prof. Steinthal and inspired by his teaching. The author gives this general survey of his undertaking:—

"We shall in this First Part, after giving a preliminary solution of the opposition of Nature and Mind, (1) trace an ideal cross-section of the development of mind, according to the principles of Folk-psychology, and (2) exhibit at length the inner lawfulness of this development, without however at this stage going into all the separate details of mental activity. Thus we shall get the basis of a general philosophical Doctrine of Categories. A Second Part will begin with the question as to the original certainty and meaning of the word Being and will then, upon this basis of all scientific knowledge, discuss the fundamental notions of the theoretic and æsthetic sciences and ethics with special reference to their mutual relations. . . . Upon this (perhaps in a Third Part) a general view of the universe is to be sought; the position of man, his importance, his tasks, his prospects within the universal life having, above all, to be critically considered. And as all being and thinking is historical and philosophy too is a process of development . . . there is requisite, in conclusion, a historic exposition" of all previous directions of thought bearing on the present.

Die monistische Philosophie. Ihr Wesen, ihre Vergangenheit und Zukunft fur die Gebildeten aller Stände dargestellt von LUDWIG A. ROSENTHAL. Berlin: Duncker, 1880. Pp. 140.

An exposition of the history of modern Monistic Philosophy, as first clearly set forth by Spinoza, under the influence of Descartes, and, after the more or less negative attitudes of Leibnitz and Kant, carried forward by Schopenhauer, followed by Geiger and Noiré down to the present day. The author conceives Monism as proclaiming the perfect unity of that which *appears* as Motion to the senses and that which as being the inner Feeling of all phenomena eludes the senses. "The external, the phenomenal, causes no more difficulty, because it presents itself alike to all observers." The real mystery is "that inner motive of all things which some regard as distinct from body, others (the Monists) as inseparably bound up therewith". The author is also specially concerned to mark off from Monism and to estimate the position of Materialism.

Grundzüge der allgemeinen Logik als einer allgemeinen Methodenlehre des theoretischen Denkens. Von Dr. A. Döring, Direktor des Gymnasiums zu Dortmund. I. Theil: 'Einleitung u. Naturlehre des theoretischen Denkens'. Dortmund: Köppenische Buchhandlung (Otto Uhlig), 1880. Pp. xii, 168.

The author published a work in 1878, *Ueber den Begriff der Philosophie* (Dortmund), in which he contended that the essence of philosophy consists in the *practical* reference given to human knowledge. He now begins the application of the conception in detail; Theory of Knowledge falling to be taken first and, as preliminary thereto, Logic. The present instalment gives his view of the relation of the two, followed up by the *Naturlehre* or Psychology of Theoretic Thought. The special features of the author's view of Logic are given thus: (1) Complete separation of Thought and Knowledge and exact determination of the nature of those functions of Thought with which Logic has to do; (2) The basing of Evidence or necessity and universality of Thought upon *Zweckgemässheit;* (3) Exposition of the *whole* of Logic as a doctrine of Method; (4) Strict separation of the synthetic and the analytic procedure of theoretic thought; (5) Careful and complete exposition of the *Naturlehre* as foundation of the doctrine of Method.

Studies in Deductive Logic. A Manual for Students. By W. Stanley Jevons. London: Macmillan, 1880. Pp. 304.

"This presently *forthcoming* book is intended to promote practical training in logic. About half of the 29 chapters consist of logical questions and problems, partly compiled from the examination-papers of the Universities and leading teachers of logic. Some hundreds of novel questions and problems have, however, been devised by the author specially for this work. The other chapters contain *answered questions*, in which the most frequent errors of students, the chief difficulties of syllogistic reasoning, and the errors of some well-known authors are concisely explained. The ingenious syllogistic cards and cylinder of Mr. Henry Cunnynghame are incidentally described. 'Equational' and Numerical Logic are pretty fully

treated, and 'The Logical Index' giving all the possible distinct forms of assertion involving any three terms is published for the first time, and its use described. In teaching the relations of propositions the author adopts the nomenclature of M. Delbœuf as described in MIND III., p. 425, and insists upon the necessity of a uniform nomenclature in mathematics and logic."

IX.—MISCELLANEOUS.

Mr. Geo. Thomson sends the following :—

"In the last number of MIND, p. 438, G. A. in noticing my book, *Evolution and Involution*, says—'So far as we can judge, the Law (of Evolution and Involution) amounts merely to the statement that every being can only understand as much of the universe as it understands, and that the higher animals understand more of it than the lower.' This would be an extraordinary statement indeed. Such an idea never entered my mind ; nor can any one explain the Law away to have such a meaningless significance. The Law of Evolution and Involution, I have expressed in a general way thus : 'The Law of Evolution and Involution is that all beings in proportion as they assume personality and *evolve* out of the universe, in that proportion do they involve it within themselves and incorporate it, approaching at the same time absolutism in all its attributes.' Perhaps my statement is not in the happiest of terms ; and if this were the only form in which it was presented in the book, the reader might be excused for not altogether comprehending it ; but when the Law is presented in a hundred forms in the pages of the book, and when the Law is explained through the *knowing* attribute in man, I do not well see how any one could misunderstand my meaning.

"One would suppose, observing the order of beings in nature, that the higher any personality is, the more would it *leave* nature. Contrast the flower, the lower animal, and the man. But the higher the personality, instead of *leaving* nature, the more is it necessitated to make the universe itself and incorporate it—so much so that a complete personality (which man is not) would wholly take up the universe and be it. And when I say 'incorporate,' I need not say to the readers of MIND, that I do not mean gross with gross. And it is not only that the Law of Evolution and Involution thus exhibits itself in the graded varieties of living beings in nature ; but in proportion as they know themselves, in exact proportion are they compelled to know the universe ; or, including all the attributes of personality, in proportion as beings *are* themselves, in exact proportion are they under an inexorable necessity to be the universe. The Law of Evolution and Involution thus brings to light the wise and beautiful conservatism of nature. Every inch of freedom or tether that she gives to her children in way of height of personality, in all the graded varieties of visible and living nature, she in the very act of giving has it enacted through all nature that inch for inch by an inexorable necessity they must become herself. This, then, in few words, is a statement of the Law of Evolution and Involution ; and I do not know much that is very great that does not hang on it, such as an explanation of the origin of good and evil, of morality, of religion, of the foundation of the ideas of space, of time, of existence, of number, of form, &c.—all which I have endeavoured to explain in the book.

On the 14th of September the statue of Spinoza at the Hague was unveiled by the direction and in the presence of the Spinoza Committee, and handed over to the municipal authorities. Dr. Van Vloten delivered an address for the occasion, which is printed in pamphlet form under the title "Spinoza de blijde boodschapper der mondige menschheid". The statue is the work of M. Frédéric Hexamer of Paris. The Committee afterwards dined together, the members of auxiliary Committees in other countries who were present being invited as their guests.

Mr. Herbert Spencer has added a new Appendix to *First Principles*, in which he deals successively with the hostile criticisms of Professor Tait and Mr. Kirkman, Prof. Cliffe Leslie, Mr. Malcolm Guthrie, Prof. Birks. This Appendix (pp. 24) may be had separately.

Prof. Schaarschmidt of Bonn has paid Prof. Adamson the great compliment of translating into German his Shaw Lectures *On the Philosophy of Kant* (reviewed in MIND XVII.). The translation (Leipzig, E. Koschny, 1880, pp. vii., 167) has been revised by the author, who has added some new notes.

Prof. John Watson, of Queen's University, Kingston, Canada, author of the article on "The Method of Kant" in the present number, will shortly issue a work on Kant's Theory of Knowledge.

Mr. William Minto, M.A., has been appointed by the Crown to the vacant chair of Logic and English in the University of Aberdeen.

The Rev. Alfred W. Momerie, D.Sc., Fellow of St. John's College, Cambridge, has been appointed Professor of Logic and Metaphysics in King's College, London, in succession to the Rev. H. W. Watkins.

The Journal of Speculative Philosophy will no longer appear at St. Louis, where it was founded fourteen years ago, but will henceforth be published by the Messrs. Appleton of New York.

THE JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. XIV., No. 3. J. H. Stirling—'Criticism of Kant's main Principles'. P. Spence—'Atomic Collision and Non-collision'. 'Kant's Anthropology' (tr.). 'Grimm on Raphael and Michael Angelo' (tr.). Notes and Discussions.

REVUE PHILOSOPHIQUE.—Vme Année, No. 7. E. Beaussire—'Introduction a l'étude du droit naturel'. H. Lachelier—'La théorie de la connaissance de Wundt'. F. Paulhan—'La personnalité'. Notes et Discussions (E. Lavisse—'Du déterminisme historique et géographique'). Analyses et Comptes-rendus. Notices bibliographiques. No. 8. E. Debon—'Les localisations psychologiques, du point de vue subjectif et critique'. G. Tarde—'La croyance et le désir : la possibilite de leur mesure'. Th. Ribot—'Les désordres généraux de la mémoire'. Analyses et Comptes-rendus. Rev. des Périod. No. 9. Ch. Bénard—'La théorie du comique dans l'esthétique allemande'. G. Tarde—'La croyance, &c.' (fin). Notes et Documents (A. Binet—'De la fusion des sensations semblables'. D. Delaunay—'Observation pour servir à la psychologie animale'). Analyses et Comptes-rendus (R. Flint, *Antitheistic Theories*, &c.). Rev. des Périod.

La Critique Philosophique.—IXme Année, Nos. 19-32. C. Renouvier—'Note au sujet de deux articles de la *Revue Philosophique*' (19); 'La démocratie et les doctrines déterministes' (24); 'La liberté au point de vue de l'observation' (27, 29). O. Hamelin—'Qu' est-ce que l'induction?' (19). J. Milsand—'L'idéal' (21, 24); 'La mythologie en politique' (29); Anonymous—'Le terrain du matérialisme suivant la critique de Lange' (25); 'En quoi la critique de Lange est restée enchainée dans le matérialisme' (30); 'Le fatalisme de Lange' (32).

La Filosofia delle Scuole Italiane.—Vol. XXI. Disp. 3. P. d'Ercole—'La psicologia positiva di Roberto Ardigò'. F. Bonatelli—'Truccioli di filosofia: osservazioni di Gerolamo Clario sulla logica del Bain'. T. Mamiani—'Sulla psicologia e la critica della conoscenza: seconda lettera al prof. S. Turbiglio'. Bibliografia, &c.

Zeitschrift für Philosophie, &c.—Bd. LXXVII. Heft 1. E. Pfleiderer—'Kantischer Kriticismus u. Englische Philosophie' (I.). E. Dreher—'Zum Verständniss der Sinneswahrnehmungen' (Schluss). Hassbach—'Die Beziehungen der Aesthetik Schopenhauers zur platonischen Aesthetik' (I.). Recensionen (R. Flint, *Antitheistic Theories;* B. P. Bowne, *Studies in Theism;* J. Veitch, *Method, &c., of Descartes,* &c.). A. Meinong—'Zu Herrn Prof. E. Pfleiderer's Recension meiner *Hume-Studien*'.

Vierteljahrsschrift für Völkerpsychologie u. Sprachwissenschaft.—Bd. XII., Heft 2. O. Flügel—'Ueber die Entwicklung der sittlichen Ideen' (Forts.). Prof. Pott—'Sprachliche Bezeichnung von Mass u. Zahl in verschiedenen Sprachen'. L. Tobler—'Zur Philosophie der Geschichte'. O. Weise—'Zur Charakteristik der Volksetymologie'. K. Himly—'Einiges ueber Schiffnamen'. Beurtheilungen. Dr. Holzman—'Zu den Psalmen u. den Rigveda-Hymnen'.

Vierteljahrsschrift für wissenschaftliche Philosophie.—Bd. IV. Heft 3. A. Horwicz—'Zur Lehre von den körperlichen Gemeingefühlen'. E. Laas—'Die Causalität des Ich'. A. Spir—'Drei Grundfragen des Idealismus: III. (Schluss). Von der Natur u. der Einheit des Ich'. Recensionen. Selbstanzeigen, &c.

Philosophische Monatshefte.—Bd. XVI. Heft 3. G. Knauer—'Seele u. Geist' (III., IV.). Recensionen. Literaturbericht. Bibliographie, &c. Heft 4, 5. H. Vaihinger—'Ein bisher unbekannter Aufsatz von Kant über die Freiheit' (mitgetheilt). F. v. Bärenbach—'Das anthropologische Grundproblem der Philosophie'. J. Bergmann—'Die Erkenntniss aus dem praktischen Selbstbewusstsein: Eine Kritik'. A. Horwicz—'Die psychologische Begründung des Pessimismus'. Recensionen, &c. Heft 6. R. Eucken—'Untersuchungen zur Geschichte der älteren deutschen Philosophie. III. Des Paracelsus Lehren von der Entwickelung'. Recensionen, &c. Heft 7, 8. Prof. Baumann—'Adam Smith's allgemeine Ansichten über Menschen u. menschliche Verhältnisse'. H. Höffding—'Zur Psychologie der Gefühle'. Recensionen, &c.

Other Books, &c., received: E. Renan, *Hibbert Lectures,* 1880, transl. by C. Beard, London (Williams & Norgate), pp. 213; E. Shirreff, *The Kindergarten: Principles of Fröbel's System and their bearing on the Education of Women,* 2nd Ed., London (Sonnenschein & Allen), pp. 112; D. M., *Scientific Transcendentalism,* London (Williams & Norgate), pp. 113; A. Valdarnini, *Principio Intendimento e Storia della Classificazione delle umane Conoscenze secondo Francesco Bacone,* 2nd Ed., Firenze (Cellini), pp. 272.

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